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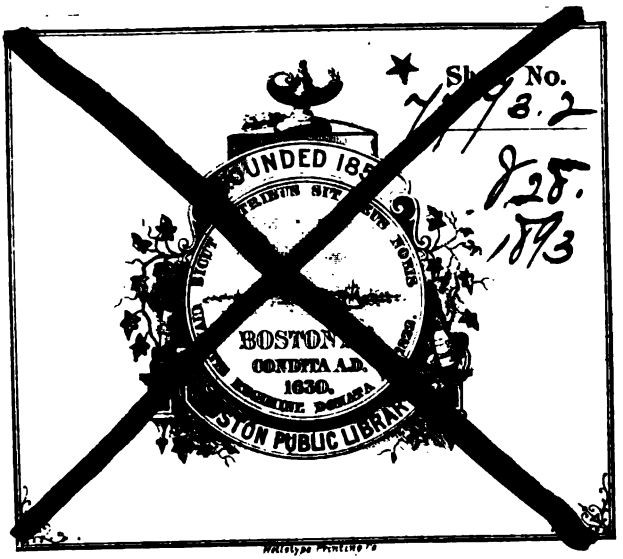
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THE

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AND

DISEASES OF WOMEN AND CHILDREN

EDITED BY

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ORIGINAL COMMUNICATIONS.

CALCIFIED TUMORS OF THE OVARY.[1]

BY

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(With two illustrations.)

WITHIN the past year several gentlemen have sent us solid tumors of the ovary which they supposed were of osseous nature, but on careful microscopical examination we found that they were not composed of bone, but were due to the calcification of ovarian structures, with which we are all familiar. In several instances the tumors were supposed to be osteomata of the ovary, when in reality they were simply calcified fibromata; and in another case what was considered as a nodule of true bone was found to be a calcified corpus luteum.

We have carefully considered the literature on the subject, and find that very little is known concerning calcific changes in the ovary, and that no one has attempted to collect even the little

[1] From the Pathological Laboratory of the Johns Hopkins University and Hospital. Read before the American Gynecological Society, May, 1893.

which is known about them. Such being the case, we have thought that it might be of interest to bring before you the specimens which have come into our hands, and then to consider what we know of this variety of changes in the ovary.

CASE I. *Calcified Fibromata of both Ovaries.*—These specimens we owe to the courtesy of Dr. Copeland, of Milwaukee, who sent them to us with the statement that they had been examined by a pathologist, who reported that they were osteomata of the ovary.

The following is an abstract of Dr. Copeland's history of the case: Age 28, married five years; no children. Menses regular, of four days' duration, and painful. Last year had an attack of cramp-like pains in the lower part of the abdomen, and during the past year has had occasional attacks of frequent micturition and has felt a lump in the right ovarian region. Two weeks before Dr. Copeland saw her she fell down-stairs. The next day, one week before the expected menstrual period, she had a profuse flow of blood, which weakened her considerably and led her to consult a physician. On examination a hard tumor was found on the right of the uterus. Laparatomy; removal of both tubes and ovaries; prompt recovery.

Description of Specimens.—The specimens were hardened in alcohol, and consisted of the appendages from each side, those from the right side being in several pieces. Left side: The tube is 8 cm. in length and 0.4 and 0.6 cm. at its thinnest and thickest parts, and is apparently normal. The parovarium is intact. The ovary measures 5, 3, and 1.75 cm. in its various diameters. On its surface are many cicatrices, but no adhesions. On section its median end is found to be occupied by a hard, roundish nodule, 12, 16, and 18 mm. in its various diameters, which lies in an apparent capsule, with which it is connected by numerous connective-tissue bands. On sawing through the nodule, which is of bony hardness, its cut surface is seen to present a mottled appearance and the general color of bone. At the lateral end of the ovary are seen the corrugated walls of an old corpus luteum about 13 mm. in diameter. Here and there are seen several follicles with clotted contents. Right side: The tube is 7 cm. in length and 0.4 and 0.6 cm. at its thinnest and thickest parts, and is apparently normal. The parovarium is intact. The ovary may be reconstructed from the various portions, when it is apparent that a large, hard nodule, measuring

7, 6, and 5 cm. in its various diameters, arose from its median end, for its lateral end is practically intact, presenting at one point a corpus luteum 1 by 0.5 cm.

From the anterior and interior surface of the ovary arise a number of small, pedunculated fibromata, the largest being 6 mm. in diameter. From the neighborhood of these small fibromata the ovarian tissue which covers the hard nodule begins to decrease in thickness, and soon becomes as thin as a sheet of paper. This thin covering is perforated in a number of places, through which the surface of the hard mass is visible.

The hard mass[1] weighs two hundred and twenty grammes and is extremely hard, almost resembling ivory in its general consistence. When thrown upon a hard surface it rebounds like a billiard ball. On section its surface is mottled and is similar to that of the smaller nodule in the left ovary.

Microscopical Examination.—Dry sections from both masses show no trace of bony structure. Portions of the masses from each ovary were decalcified by a ten-per-cent solution of nitric acid, when microscopic sections could readily be made. Stained sections show that the masses from both ovaries are absolutely identical in structure. They are composed of typical fibrous tissue, made up of bundles of dense connective tissue, which interlace in all directions, with very few long nuclei. This tissue stains readily and is more or less similar to that found in the hilum of the ovary, except that it is much poorer in blood vessels and contains many more veins than arteries. Scattered all through it are irregularly shaped areas of various size, which stain deeply with hematoxylin. Generally they have very sharply marked contours and in their interior show signs of striation, but no trace of nuclei can be found within them. They represent areas of calcification from which the lime salts have been dissolved by the nitric acid. (Their appearance is fairly well represented in Fig. 1, which is drawn under a low power.) Under the high power of the microscope the development of the calcified areas may be clearly traced. Here and there we see individual cells which have lost their nuclei and present the typical appearance of coagulation necrosis. Then we see simi-

[1] Chemical analysis of the mass shows that it contains moisture, 8.40 per cent; agaric matter, 21.36 per cent; and mineral matter, 68.24 per cent. The mineral matter consists of the phosphates and carbonates of calcium in the proportion of fifteen to one, and a trace of sodium phosphate.

lar cells which contain perhaps only a single calcareous granule, and others which are entirely calcified. By the coalescence of individual calcified cells larger calcified masses are produced; these in turn coalesce with others and form the large areas shown in Fig. 1.

It is evident that the calcification has occurred in necrotic areas of the fibroma. Nowhere in the specimen is there any

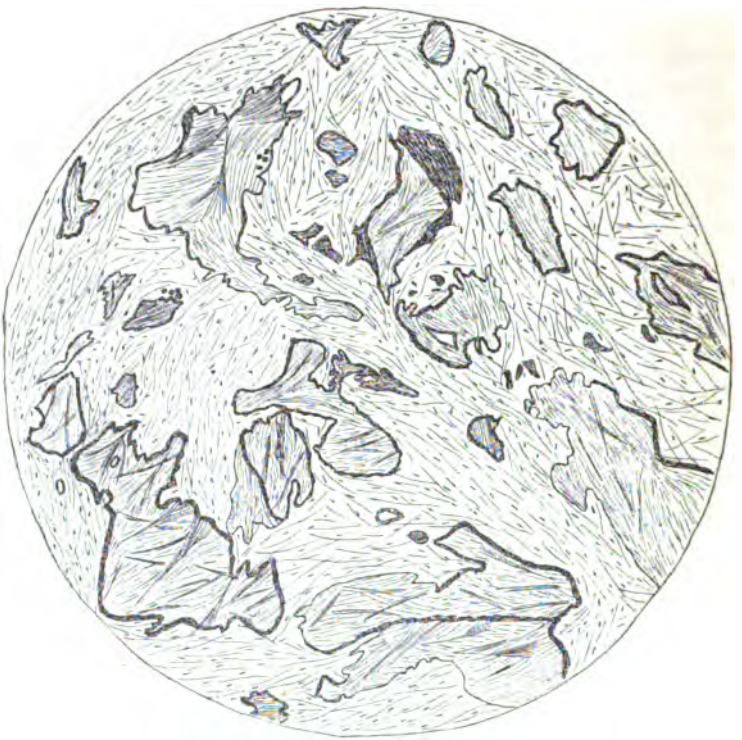


FIG. 1.—Calcified fibroma of ovary, Case 1. (Zeiss objective AA. Eye piece No. 4.)

trace whatever of bone. Except for the calcified fibromata, both the tubes and ovaries are normal.

CASE II. *Calcified Fibroma of the Left Ovary.*—We are indebted to Dr. Robt. T. Wilson, of Baltimore, for the following specimen. The history is as follows: Age 24, single; menses first appeared at 13 years; has suffered more or less ever since their appearance. For the past three years menses every six to seven weeks, lasting five to seven days, confining her to bed during the entire period, and not infrequently are accompanied by con-

vulsions. For the three months previous to operation severe pains in back and ovarian regions, constant headache and insomnia, which necessitated the frequent employment of morphia. Three or four weeks before the operation she is said to have had an attack of peritonitis.

Upon examination the "left ovary was found enlarged and prolapsed." Laparatomy; removal of both tubes and ovaries. At operation "the peritoneum was found thickened, showing signs of chronic inflammation." Death on the seventh day from peritonitis.

Description of Specimens.—Left side: The tube is 9 cm. in length and 0.3 and 0.4 cm. in diameter at its thickest and thinnest parts, and is apparently normal. The parovarium is intact. The ovary measures 5, 4, and 4 cm. in its various diameters, and is very hard to the touch. On its superior margin is a fresh corpus luteum, 2 by 0.75 cm., filled with decolorized clot; its yellow margins are 1 mm. thick. The surface of the ovary is glistening and presents numerous rounded elevations which vary from 1 to 10 mm. in diameter. The entire ovary is hard to the touch, and when dropped upon the table sounds as if it were bone. It is impossible to cut it with a knife, for it is found that its greater part is composed of a hard mass which is probably calcareous. The mass is entirely covered by typical ovarian tissue, which varies from ½ to 3 mm. in thickness and contains both follicles and the yellow remains of an old corpus luteum. The greater number of the nodules noted on the exterior of the ovary are found to correspond to irregularities upon the outer surface of the hard mass, and are thoroughly calcified; several of them, however, particularly one on the posterior surface, are readily cut and present the usual appearance of fibromata. On the anterior surface of the ovary several of these calcareous nodules project through the ovarian tissue which covers the rest of the mass. The mass can be cut only by means of a saw, and on section it is seen to be composed of a number of small, very hard areas separated by bands of tissue. The fibrous mass on the posterior surface, mentioned above, is seen to be continuous with the main portion of the hard mass. Right side: The tube is 9.5 cm. in length and 0.3 and 0.5 cm. in diameter at its thinnest and thickest parts, and is apparently normal. The ovary measures 3, 2.5, and 1.5 cm. in its various diameters, with many corrugations, but no adhesions on its

surface. On section it contains many follicles and corpora fibrosa.

Microscopic Examination.—Both tubes are perfectly normal. Sections from decalcified portions of the left ovary show that the great part of the tumor is composed of interlacing bands of connective tissue, with numerous irregularly shaped areas of calcification of various size scattered through it. No definite structure can be made out in the calcified areas; they present a somewhat striated appearance, with absolutely no trace of nuclei. The growth, except for the calcified areas, resembles the tissue usually found in the hilum of the ovary, except that it contains fewer blood vessels; a considerable number of veins may be made out, but only a very small proportion of arteries. It is readily seen that the tumor is identical with those in the preceding case, and that Fig. 1 applies equally well to it. The ovarian tissue surrounding the tumor mass presents its usual appearance and contains ova, follicles, corpora lutea, and corpora fibrosa. In one corpus fibrosum there is a small cavity, apparently indicating the formation of a small cyst. Except for a slight amount of endarteritis, the right ovary is normal.

From the description of the microscopical appearance of these three tumors there can be absolutely no doubt as to their nature. A single glance at Fig. 1—which applies equally to all of them, for they all present identically the same structure—suffices to show that all the characteristics of bone formation are lacking and that we have to deal with the calcification of necrotic areas in ovarian fibroids.

That the calcification is the sequel of necrosis has already been indicated, and will be made perfectly clear when we come to consider the etiology of calcification.

A point of considerable interest in all of these tumors is the fact that the function of the small portions of unchanged ovarian tissue by which the tumors are surrounded is not interfered with by the formation and growth of the fibromata and their subsequent calcification, as is shown by the fact that typical corpora lutea may be seen in each of the three ovaries.

The fact that we have shown that the tumors under consideration are not osteomata of the ovary does not take away at all from their interest; for a careful survey of the literature shows that calcified fibromata of the ovary are of extremely rare occurrence, and, if for no other reason, are of interest on account of

their rarity. It is well known that uncomplicated fibromata of the ovary occur but rarely, as is stated by Leopold,[10] Olshausen,[28] and Coe,[4] and that probably the great majority of cases so described are in reality sarcomata. If the ovarian fibromata themselves are rare, how much more so must they be when calcified!

A considerable number of writers state that ovarian fibroids do occasionally become calcified. They usually base their statements upon the analogy which should exist between fibroids of the ovary and uterus; for it is well known that calcified areas are not infrequently found in uterine fibromata and myofibromata, but they have not seen such cases themselves. In this connection may be mentioned Hooper,[12] Klob,[17] Ashwell,[3] Churchill,[4] Talamon,[23] and Howell.[13]

As far as we can learn, the only case which is without doubt similar to ours is one reported in 1859 by Sir Spencer Wells.[26] At the autopsy on a woman, age 64, "dead of diseased heart and kidneys," he found a tumor, the size of a cocoanut, occupying the seat of the left ovary. It was so hard that it had to be cut with a saw, and on microscopic examination it was seen to be "composed of fibrous tissue, the denser parts being calcified by a deposit of carbonate of lime. There was no tissue found in the least resembling bone."

As our three tumors were considered to be of a bony character until a careful microscopic examination demonstrated that they were calcified fibromata, we do not consider that we shall go far wrong if we assume that all of the so-called bony tumors of the ovary which have hitherto been described, and in which nothing definite is said as to their microscopic appearance, are likewise calcified, and not osseous, tumors of the ovary. For it is well known what great confusion has long existed as to the significance of the terms calcification, petrification, and ossification, and the practical impossibility of distinguishing between them except by means of the microscope, even when one holds the most approved views as to the difference between the several processes.

From this standpoint the number of these cases may be considerably increased, and it is curious that more was said about them by the writers of seventy-five or one hundred years ago than by those of more recent times. The first case of this variety of which we are able to find any record is one reported by

[10] The small figures refer to Bibliography at end of the article.

Schlenker[8] in a thesis entitled "De singulari Ovarii sinistri Morbo." A few years later (1760) Le Clerc de Beaucoudray,[9] in an article entitled "Sur un Ovaire ossifié," gave a meagre description of a case with which he had met at autopsy.

That a considerable number of cases had been described during the past century is evident from the statement of Voigtel[10] in his work on pathological anatomy (1805), who referred to several bony tumors of the ovary and stated "that one not infrequently finds stony concretions in the ovaries." Unfortunately, however, in most cases we have been unable to verify his statements by recourse to the original articles; for many of them could not be found in the Library of the Surgeon-General's Office in Washington, and in several instances his references were faulty.

Haase[11] (1836) referred to an ossified tumor of the ovary which had been presented to the Entbindungs-Institut in Dresden by Dr. Rotter. It measured 3, 4, and 5 inches in its various diameters, and weighed eight ounces. He said that "the mass is composed of almost bony nodules the size of peas, which are connected and grouped together."

Löbl[12] (1844) also described a case of Rokitansky's as follows: "An ossified fibroid the size of a child's head, with numerous flattish bosses, was attached to the external end of the right ovary and elongated it and its ligament to a considerable extent."

There can be but little doubt that an ovarian tumor which constituted an obstacle to labor in a woman upon whom Kleinwächter[13] was obliged to perform Cesarean section, was also a calcified fibroma. In this case the right ovary was converted into a tumor the size of a child's head, which filled up the pelvis and was removed at autopsy. "It was rounded, nodulated, and hard, and, with the exception of a portion the size of a walnut, was entirely ossified. The portion which was not ossified creaked on section, had a white, firm, fibrous structure, and on microscopical examination was a simple fibroid."

The same may be said of a "bony tumor" removed by Nottingham[14] in 1872 from a woman aged 25. The tumor occupied the entire right ovary and was as large as a fetal head. He says that it was "encased in a tegumentary envelope, it was almost entirely bone, there being here and there a slight admixture of fibrous substance. Its osseous nature was so decided that a strong knife could not be made to penetrate it at any point. To

open it for inspection a saw had to be brought into requisition. Its weight, when dried of blood, was one and three-quarter pounds. Neither hair nor teeth were observed in any part of it."

The only other reference to a calcified tumor of the ovary which we have been able to find is a case reported to the New York Obstetrical Society by our Fellow, Dr. H. M. Sims[9] (1889), who, on removing the ovaries for the cure of a uterine fibroid, found that the right ovary "was calcified and hardened." But as he failed to give any particulars concerning the specimen, it is doubtful whether it belongs in this category.

When we consider that in the literature for the past one hundred and fifty years we have been able to find only eight cases which can be compared with those which we have just described, and that several of these eight cases are open to serious doubt, it is evident how very rare calcified fibromata of the ovary must be.

True, osseous tumors may also occur in the ovary, but they are even more rare than calcified tumors, and it is far more difficult to give a satisfactory explanation for their occurrence than for the calcific changes in fibromata. And it must also be remembered that osseous formations occur but rarely in any portion of the body, while calcification occurs very frequently in many organs. Of course, in speaking of osseous tumors of the ovary, we must exclude all growths which are connected with dermoid cysts, and consider only those in which we find no other deviation from the normal structure of the ovary than the new bone formation. Osseous formations of this character can only be explained by Cohnheim's tumor hypothesis.

The only cases of osseous formations in the ovary are those mentioned by Fürst,[10] Reiss,[11] Waldeyer,[12] and Winckel.[13] In the case of Fürst and the one mentioned by Winckel, the osseous formation occurred in the walls of ovarian cysts, so that they can hardly be considered in this connection. Reiss' case was a fibroma of the ovary, which at its lateral end presented a number of areas composed of hyaline cartilage, in the midst of which was a nodule, the size of a cherry, which macroscopically presented the appearance of spongy bone, which it was found to be upon microscopic examination. This, however, would appear rather as a further development of the enchondroma than as an osseous tumor of the ovary.

Accordingly the only tumor which might have been confounded with the calcified fibromata of which we have been speaking is the one reported by Waldeyer[4] under the title, "Diffuse Fibroid of the Ovary of a Peculiar Structure" ("Diffuses Eierstocksfibrom von eigenthümlichem Baue"). This was a very hard tumor, measuring 15, 11, and 9 cm. in its various diameters, which macroscopically presented the appearance of an osteoid tumor, recalling those from the upper jaw. But its microscopic appearance did not justify him in concluding that it was true bone. Admitting, however, that the case described by Waldeyer[4] was really an osteoma—for typical osteomata have been described in the testicle (Neumann[5]), and there is no reason why they should not also occur in the ovary—it is seen that the literature affords only a single case (and that a doubtful one) of an osseous growth of the ovary which can be compared with the calcified fibromata under consideration.

In view of the facts here brought forward, we believe that it is perfectly justifiable to consider that any solid tumor of the ovary is a calcified fibroma, even if at first sight it presents all the characteristics of bone, unless a microscopic examination by a competent observer demonstrates that it is really an osteoma.

Case III. *Calcified Corpus Luteum.*—The specimen which we now present was exhibited last year at the New York Obstetrical Society by our distinguished Fellow, Dr. Coe,[6] as a "diseased ovary containing true bone, and not being a dermoid cyst," after which he sent it to us. It was removed from an unmarried woman, who suffered severely with her menses, especially over the region of the right ovary. At the operation both tubes and ovaries were removed. The left ovary was cystic and enlarged to the size of a Messina orange, the right was the size of a walnut; both tubes were normal, and the uterus small, retroflexed, and non-adherent. In the centre of the right ovary was the nodule, which we shall describe, and which was pronounced by a New York pathologist to "consist of true bone, while in its centre was a soft mass presenting the microscopical appearance of marrow."

Description of Specimen.—Left tube and ovary preserved in alcohol. The tube is 6 cm. in length and 0.3 and 0.5 cm. in diameter at its thinnest and thickest parts. It is apparently normal, as is also the parovarium. The ovary has been split

open and is 5 cm. long and 2.5 cm. deep. On its surface are many cicatrices, but no signs of adhesions. In its centre is a hard mass, 12 mm. in diameter, of bone-like consistence. When sawed through it is seen to consist of two portions, a soft, pinkish central portion (Fig. 2 B), and a hard, bone-like exterior (Fig. 2 A) which is 2 mm. thick and of a distinctly yellow color. The central portion of the nodule resembles partially organized blood clot. The rest of the ovary presents a normal appearance.

Microscopic Examination.—After decalcification of a portion of the nodule, sections are readily cut. Neither the examination of thin portions of the nodule in its natural state, nor the examination of stained sections after decalcification, shows any signs of osseous structure.

The decalcified sections, in general, stain poorly; but the hard exterior of the nodule stains readily with hematoxylin, and presents a more or less homogeneous granular appearance, in which

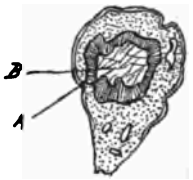


FIG. 2.—Cross-section right ovary, Case 3, natural size, showing calcified corpus luteum. A, calcified outer margin; B, soft tissue in centre.

it is impossible to distinguish any sign of nuclei. This is surrounded by more or less typical ovarian stroma which stains poorly. The soft central portion of the nodule is composed of dense fibrous tissue which is very poor in cells. Between this and the decalcified portion we see several layers of small cells, which possibly correspond to the membrana granulosa, though it is impossible to state their origin with certainty. In the ovarian stroma surrounding the decalcified nodule are numerous round, stellate crystals, which are probably the result of the decalcification. In all probability the specimen represents a calcification of the large cells which surround a ripe Graafian follicle, and which form the yellow margin of the corpus luteum, while the fibrous tissue in its interior probably represents an organized blood clot.

After our examination Dr. Coe withdrew the statement that the nodule was composed of bone, and upon the strength of it

Bland Sutton,[11] in December last, reported two cases of calcified corpora lutea with which he had met. In one case there were two calcified corpora lutea in the same ovary, and in the second case there was a single one which measured 3 by 1 cm. All three of his calcified corpora lutea were of a bright-yellow color and consisted of a dense tissue in which lime salts were deposited.

When we first examined our specimen of calcified corpus luteum we believed that we had found something absolutely unique. But this supposition was, of course, proved to be without foundation by the publication of Sutton's[11] cases; and a search through the literature showed that a number of the older writers had met with similar conditions, which, in some instances, they had interpreted correctly, while in other cases their excellent objective descriptions leave but little doubt that they had to deal with similar bodies. Thus Morgagni[14, 15, 16] recorded three cases in which it is more than likely that he had to deal with various forms of calcified corpora lutea. Of one case he said:[14] "In the other ovary, besides the smaller vesicles filled with clear fluid, I have found larger cellules (cellulas), and two of them empty, one of which had a partly osseous tunic, while the other was entirely osseous and marked by so many sulci that it resembled the folds of the intestine." In a second case he said:[15] "In the same ovary in which there was the corpus luteum there was a rounded osseous mass (cellula) whose centre was filled with a bloody fluid." And in a third case, occurring in a woman aged 50:[16] "The ovaries were not only white, hard, and uneven, but hidden in the centre of one of them is a white body, rounded, almost entirely hollow, and cartilaginous." More or less similar cases have also been reported by Sandifort[17] and Walter.[18] And Rokitansky[19] reported a case of which there can be no doubt. In this there was an old corpus luteum the size of a nut, in whose wall at one point there was a hard, osseous (?) nodule the size of a pea. And Klob[17] stated that Meckel[19] said that "shrivelled-up corpora albida become ossified and occasionally are converted into solid bone."

It is thus readily seen that the observations of Sutton[11] and ourselves are not isolated, and other observers have also met with calcified corpora lutea.

Indeed, upon consideration, it is surprising that more cases have not been observed and reported; for it will soon be shown

that the corpus luteum frequently presents conditions which apparently should predispose it to calcification.

Etiology.—Having described the cases of calcified tumors of the ovary with which we have met, and given some idea as to the literature upon the subject, we propose to consider for a few moments the general etiology of calcification, and then attempt to explain why the tumors under consideration should have become calcified.

It is needless to dwell upon the frequent occurrence of calcification in the various organs, and it will suffice to state that calcareous deposits occur very frequently in the blood vessels, lungs, tumors of various kinds (especially fibromata and myomata), kidneys, and also in foreign bodies, as in the fetus of extra-uterine pregnancy, forming the lithopedion, and in various forms of parasites. And in all these conditions the calcification is more or less of a conservative process, as is most clearly illustrated by the foci of calcification which are found in the lungs after the healing of tuberculosis.

Of course there must be some general reason why calcification should occur in the various tissues as frequently as it does, and this is to be found in the fact that the process is nearly always preceded by more or less necrosis of the affected parts. By this it is not meant that all forms of necrosis lead to calcification, for it is well known that such is not the case; but calcification only follows certain varieties of necrosis, particularly coagulation necrosis (Cohnheim[7] and Litten[21]), and then only under certain conditions.

These conditions are best studied in experiments upon the lower animals, and especially upon the kidneys of rabbits. It is now a well-established fact, as was first pointed out by Saikowsky,[16] that calcareous material is deposited in the kidneys of rabbits which have been poisoned with corrosive sublimate. Saikowsky's results have been confirmed by a large number of investigators, but especially by Kaufmann,[18] Neuberger,[26] and others. In these cases the calcareous material appears in the kidneys within twenty-four hours after the sublimate has been given, and gradually increases in amount, if the animal survives long enough, until the kidney is almost too hard to be cut with a knife. It has been clearly shown that the first effect of the sublimate upon the kidneys is to produce coagulation necrosis of its epithelium, especially in the convoluted tubules, in which

the lime salts are soon deposited. Strange to say, the same deposit of calcareous material does not occur in dogs when poisoned with sublimate; but in them it is found that the renal epithelium undergoes fatty degeneration instead of coagulation necrosis, and calcification does not appear to follow that variety of degeneration.

Calcareous changes exactly similar to those observed in rabbits occur in women who have died from sublimate poisoning, and have been described by Dahl,[6] Fleischmann,[9] Kaufmann,[14] Netzel,[27] Prevost,[28] Steffeck,[46] and Virchow.

Poisoning with other substances also leads to renal changes similar to those produced by sublimate. Among them may be mentioned poisoning with glycerin and pyrogallic acid (Afanassiew[1]), bismuth (Langhans[19]), aloin and phosphorus (Neuberger[29]). And the calcareous deposits which occasionally follow diphtheria and scarlet fever have been attributed by Litten[22] to the necrotic changes which are produced in the kidneys by the poisons accompanying the diseases.

In all these instances the first effect of the poison is to produce coagulation necrosis of the renal epithelium, particularly in the convoluted tubules.

Litten,[22] in his beautiful experimental work upon the production of infarctions, found that arterial anemia would produce almost identically the same changes. Thus, after ligating the renal artery for two hours and then removing the ligature, no changes were at first observed; but after a short time, when the renal circulation had been once more established, coagulation necrosis of the renal epithelium could be observed, and this was followed by a deposit of calcareous material. If the ligature were not removed the kidney simply decomposed, but showed no signs of coagulation necrosis or calcification. He accordingly found that something more than the death of the cells was necessary for the production of these changes; that it was necessary for it to occur in living tissue—namely, where the affected cells could obtain a certain supply of blood or lymph.

He considers that the calcification of the necrotic areas is due to the chemical affinity which exists between the necrotic tissue and the calcium salts which are circulating in the blood, probably as a soluble albuminate, which causes them to combine with some of the material of the dead cells and form an insoluble albuminate of lime, which is deposited in them.

Such appears to be the general law governing the production of calcareous deposits—namely, coagulation necrosis of tissue to which some supply of blood or lymph is admitted.

There are, no doubt, subtle differences in the varieties of coagulation necrosis, which occasionally appear to contradict what has just been said. Thus, for example, Kabierski[11] has shown that chromic-acid poisoning will produce coagulation necrosis in rabbit's kidneys which is practically identical with that resulting from anemia and the various agents just enumerated, but calcification fails to follow it.

Can this experimental work be transferred to human pathology, and particularly to the structures under consideration?

Any one who will take the trouble to consider the various varieties of calcific changes in the body will see that conditions more or less similar to those just mentioned precede every variety of calcification, and that it is invariably the sequel of tissue death or necrosis, and is indicative of degeneration and not of a progressive new growth.

It is well known how frequently calcareous changes occur in the uterine fibromata, and there is every reason to suppose that they occur with equal frequency in ovarian fibroids, the difference in the apparent frequency of calcified ovarian and uterine fibroids being due to the great rarity of ovarian fibromata and myo-fibromata and the very frequent occurrence of corresponding growths in the uterus.

It is readily seen that ovarian fibroids present abundant opportunity for calcareous changes, for they are usually quite poorly supplied with blood, and a very slight interference with their circulation could readily suffice for the production of anemic coagulation necrosis with subsequent deposit of calcareous material in the necrosed areas. This mode of origin was observed in the three calcified fibromata of the ovary already described. We are unable to determine the cause of the primary interference with the circulation in these cases; but it is readily seen that the ovary is subjected to a greater extent than most organs to circulatory changes which, under certain circumstances, may lead to the production of necrosis.

A priori one would suppose that the corpus luteum would be particularly prone to calcification, for in its life history the large cells which make up its outer yellow margin undergo hyaline degeneration before entering into the formation of the

transparent corpus fibrosum. Calcareous changes, however, occur but very rarely in it, so we must accordingly suppose that the usual degeneration of the corpus luteum is not of the variety which is most prone to lead to calcification.

Clinical History.—The clinical history of calcified tumors of the ovary does not offer any characteristics which will serve to distinguish this class of tumors from other solid tumors of the ovary, and consequently can be dismissed in a few words. These tumors rarely attain a large size, the largest recorded not exceeding a child's head in size. This is readily understood when we recall the fact that calcification is a sign of degeneration and not of active growth. In two of our cases (2 and 3) there was marked dysmenorrhea, which was due, no doubt, to the pressure exerted by the unyielding calcareous mass upon the nerves in the interior of the ovary. In several cases—our first case and the one reported by Nottingham [1]—there was marked uterine hemorrhage, which ceased entirely after the removal of the growths. The other symptoms of this class of tumors are purely mechanical and are dependent upon the size of the growth, and do not differ in any way from those produced by other solid tumors of the ovary.

Diagnosis.—It is absolutely impossible to diagnose small calcified tumors of the ovary which have not led to considerable increase in its size, and only in rare instances will it be possible to diagnose larger ones from other solid tumors of the uterus or ovary, for on palpation simple fibromata not infrequently feel as hard as if they were calcified.

Treatment.—As the diagnosis of these tumors from other solid tumors of the ovary is practically impossible, one will hardly be called upon to decide as to their treatment; but if by any chance a diagnosis should be made, the removal of the tumor is indicated.

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PUERPERAL ECLAMPSIA:

THE EXPERIENCE OF THE BOSTON LYING-IN HOSPITAL DURING THE LAST EIGHT YEARS.[1]

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IT is not proposed in this paper to discuss the various theories concerning the pathology and ætiology[2] of puerperal eclampsia. While one cannot deny the occasional occurrence of cases of epileptiform convulsions without albuminuria and without uræmic

[1] Read before the American Gynecological Society, May, 1893.

[2] Diphthongs retained by request of author.

symptoms, which are explained by Braun and by Spiegelberg as attributable to reflex stimulation of the vaso-motor and convulsive centres; and while it should not be forgotten that, as Tyson has well said, "There are no reasons why we should exclude from the causes of convulsions in the puerperal state those which operate to produce convulsions in the non-puerperal condition," as for example, cerebral hæmorrhage and hysteria,—it is nevertheless true that, in the vast majority of cases of eclampsia occurring during pregnancy, labor, or the puerperium, the cause is to be found in acute parenchymatous nephritis, in renal insufficiency, in acute renal suppression, with retention in the blood of excrementitious materials, and consequent uræmic poisoning. To the consideration of the experience of the Boston Lying-in Hospital with this class of cases, from 1885 to 1892 inclusive, this communication is directed. It has seemed best not to include cases prior to 1885, the year in which the present methods of aseptic obstetrics were introduced, since the modifying influence, on any specific line of treatment, of occasional invasions of puerperal sepsis, renders the statistics and results of the pre-antiseptic period not fairly comparable with those of the present aseptic era.

In examining the methods and results of the hospital during these eight years, it should be borne in mind that, while there is substantial agreement in the staff as to the general management of eclampsia, owing to changes in the visiting staff, and substitute service by the out-patient staff, the judgment of six different physicians is concerned in the care of the cases included in this report: this circumstance and the fact that the house physician changes every two months will explain some minor differences in methods. It should also be stated that the hospital does not, except in rare instances, receive waiting patients, and that consequently no opportunity is afforded for prophylactic treatment during pregnancy; in fact all the thirteen cases of ante-partum eclampsia were brought to the hospital after one or more convulsive seizures, and seven of them in a state of profound coma. Further, no case of eclampsia has been refused admission. It is a rule of the hospital, however, that the urine of every patient shall be drawn by catheter and examined as soon as possible after entrance; then, if the condition of the urine or the presence of general symptoms shows the danger signals of eclampsia, prophylactic measures are adopted which are some-

times, doubtless, successful in arresting toxæmia and averting the convulsive seizure.

Puerperal eclampsia is believed to occur once in about five hundred pregnancies, and as this hospital cares for about five hundred house patients yearly, eight cases of eclampsia would be its due proportion in the period covered by this report: that during this time the hospital has received thirty-six cases, an average of four and one-half each year, is due, of course, partly to the fact, as in hospitals generally, that eclamptics are sent in from Boston and its suburbs who would have been attended in their homes except for the serious complication, and partly to the general condition of hospital patients, who come from that class in the community which receives no supervision during pregnancy, no adequate prophylactic treatment in the face of threatening symptoms, and who therefore are more liable than those better circumstanced to suffer the eclamptic seizure under the shock and pain of labor.

As the management of eclampsia varies according as the invasion occurs during pregnancy, during labor, or during the lying-in period, the cases presented will be grouped accordingly. There are thirteen cases of ante-partum convulsions, eight cases of inter-partum, and fifteen cases of post-partum; or, approximately, 36%, 22%, and 42% respectively.

ANTE-PARTUM ECLAMPSIA.

In the treatment of ante-partum eclampsia, especially when the seizure occurs before the fœtus is viable, the aim of the obstetrician is, of course, to arrest the convulsions and restore the function of the kidneys, without interrupting the pregnancy. When the convulsions have been few in number and of moderate severity, when the renal insufficiency is not extreme, and when the skin and bowels respond promptly to measures adopted to promote their vicarious function of eliminating from the blood the waste products which are exerting their poisonous effect on the nervous system, there is a reasonable prospect of success in this aim; but in hospital practice, unfortunately, the cases are few in number in which these conditions are fulfilled. Moreover, the fœtus often perishes early in utero from the overwhelming effects of the poisonous elements in the maternal blood, or is lost by spontaneous miscarriage, induced by the convulsive action of the uterine, as well as of the voluntary, mus-

cles. It is certainly legitimate to endeavor, however, when it can be done without undue risk to the safety of maternal life, to treat ante-partum eclampsia without obstetric interference, and in a small proportion of cases well-directed efforts will be successful.

The methods adopted by the Boston Lying-in Hospital are briefly as follows:

Ether is used, at the first symptom of the attack, to control the convulsive seizure. I am well aware that it will be said in criticism, by most authorities from other vicinities than Boston, that chloroform is a safer drug than ether, when the kidney is in any way affected; but it would be difficult to convince those who have had a long experience with ether, that, with intelligent and careful use, this drug is not as safe as chloroform. Chloral hydrate, by rectum, is employed as a nerve sedative between the attacks. Morphia, so highly prized by some authorities, is not approved: while in some cases it may seem to prove a useful sedative, in others it has appeared to cause restlessness; and its use would seem unphysiological, when the loss of renal function is considered. To excite the action of the skin, chief reliance is placed upon the hot bath, the hot-air bath,[1] or, in mild cases, the use of heaters placed about the patient rolled in blankets; and, for drugs, pilocarpin, usually in gr. $\frac{1}{8}$ doses, guarded by brandy or other stimulants to avoid undue depression. Unless the skin responds promptly and satisfactorily, the eliminative action of the bowels is invoked with elaterium or croton oil, aided, if necessary, by enemata. When the patient is sufficiently conscious to swallow, milk is given, with brandy, if indicated; and she is encouraged to drink freely of cream of tartar water (iv. to pint i.), not alone for its mildly diuretic effect, but for its cumulative influence as a cathartic. Digitalis is also employed in small doses, not only as a heart tonic, but as a mild diuretic. Acetate of potash is also used to some extent. When the patient is unable to swallow, subcutaneous stimulation with brandy, digitalis, or nitro-glycerine is resorted to. Venesection has been employed in no instance: while not denying its occasional value in certain cases, the hospital staff saw no indication for blood-

[1] This is administered by means of a stove pipe elbow attached to the foot of the bed, under the lower end of which is placed a gas, or other, lamp; the patient being rolled in blankets and covered with other blankets supported by a cradle.

letting in any case included in this report. When, as is generally necessary in severe cases, it appears best to deliver, manual dilatation is preferred to the use of hydrostatic bags, or the intra-uterine bougie: in a few cases of unusual difficulty incision of the cervix has been necessary. Podalic version and manual extraction are preferred to forceps unless the head is engaged. During delivery the patient is well wrapped in blankets and exposed as little as possible, to avoid chilling the surface and checking the skin secretion which may have been induced.

In the following group of three cases in the non-viable period of pregnancy, there was no obstetric interference, as the maternal symptoms appeared to warrant an effort to save the fœtus:

Case I.—H. C., 20, S., Igravida seven months advanced. Had had one well-marked convulsion a few hours previous to entrance, and had been given morph. sulph. gr. ¼. On admission, stupid, but could answer questions with considerable urging: skin very dry: twitching of eyelids, especially of left; convulsive movements of hands and forearms, but no well marked convulsion after entrance: frequent vomiting. Urine by catheter: acid, 1018, albumin ¼%; sediment abundant,—small round cells, blood, granular, hyaline and epithelial casts. Was placed in a warm bath and given chloral by rectum. Urine in next 24 hours ʒ xxviii. Next day, no more twitching, but vomiting continued: hands and feet œdematous: urine, fair amount, albumin a slight trace, no casts found. Next day, much less vomiting, urine clear. Gradual improvement from this time: three days later up and about the ward; urine free and no albumin. Discharged six days from entrance in good condition, with no interruption of pregnancy.

Six weeks later was re-admitted, supposedly in labor. Urine scanty, albumin a slight trace: was given potass. acetas. Signs of labor disappeared, and patient discharged in three days.

Two weeks later, re-admitted in labor at full term. Urine: large amount, acid, 1015, albumin a large trace; sediment,—pus, blood, and amorphous urates; no casts. Labor normal, no sign of eclampsia. Convalescence normal.

Discharged in two weeks, well: child well.

Case II.—M. C., 26, M., Igravida six months advanced. Six days previously face puffy and feet swollen: two days later, violent headache, sharp epigastric pain, vomiting: soon after, vertigo, followed by five convulsions in six hours, each of about

five minutes duration and mild. From 3 to 8 P.M., just prior to entrance, had four convulsions more severe than preceding. On entrance, face pale and puffy; moderate œdema of legs and feet; mind clear. Urine: high colored, turbid, acid, 1032, albumin 1+%; sediment much; renal epithelium, abnormal red blood corpuscles, many hyaline and fine granular casts, some medium granular casts, and casts with epithelium adherent. On entrance: hot-air bath at 110°–120°, pilocarpin gr. $\frac{1}{6}$; profuse perspiration for two hours, during which time one general clonic convulsion of $\frac{1}{2}$ minute duration, followed by ten minutes of unconsciousness. Was given potass. acetas gr. xxx every two hours, tr. digitalis ℥v every four hours, and potass. bitartras ad libitum. During first 24 hours in hospital passed urine ʒ xxxii; pale, alkaline, 1022, albumin $\frac{1}{4}$%.

During second 24 hours comfortable all day until evening, then return of headache: face more puffy than in morning. Without warning a slight convulsion lasting $\frac{1}{2}$ minute; consciousness returned at once. Placed in hot-air bath for two hours: profuse diaphoresis. Twenty-four hours' urine ʒ xlviii; pale, 1010, albumin $\frac{1}{8}$%; casts less in number. Next day no more convulsions, slight headache at times, bowels open, face still puffy, generally comfortable.

During the next three days patient remained comfortable; there were no more convulsions. Amount of urine continued large, reaching nine pints one day; facial œdema much diminished. Was kept on a milk diet, given water freely, and no drug but potass. acetas gr. xv every four hours. After ten days in hospital patient insisted on going home. Urine: pale, alkaline, abundant, 1018, albumin $\frac{1}{8}$%, one hyaline cast in two slides.

Discharged much relieved: pregnancy uninterrupted.

[Three weeks later, in her own home, patient miscarried, and suffered return of œdema; after delivery œdema disappeared, but headache and dizziness continued.]

CASE III.—A.O., 22, M., Igravida six to seven months advanced. Headache for two weeks, œdema of hands and feet. First convulsion ten and one-half hours before entrance; was kept under ether from this time until admission, during which time six convulsions, seven in all before entrance. On admission, comatose, but restless. Urine: albumin 1%; very numerous casts,—hyaline, fine, coarse, and brown granular, blood and epithelial casts,

free blood, and renal cells. No signs of labor. Placed in blankets and heaters; pilocarpin gr. $\frac{1}{4}$; free sudoresis and salivation. Croton oil gtt. iii by rectum. Severe convulsion two and one-half hours after entrance: ether, followed by chloral gr. xxx by rectum. Croton oil gtt. i on tongue; pilocarpin gr. $\frac{1}{8}$: profuse vomiting. As bowels had not moved six hours after entrance, was given croton oil gtt. iii, calomel gr. v, and jalap gr. vi. by rectum; one hour later, elaterium gr. $\frac{1}{5}$, followed by turpentine enema; soon after, a large, loose, watery dejection. Soon after, pilocarpin repeated. Patient could now swallow and was given solution of potass. bitartras ad libitum. Milk, and brandy ʒ ii, given every two hours, and pilocarpin p. r. n. to maintain free sudoresis. Elaterium gr. $\frac{1}{8}$ was given three times during the night, resulting in five large, watery dejections. At the morning visit patient was still unconscious, but was breathing quietly, and everything seemed favorable to the arrest of symptoms without the induction of labor; but whether due to the eclamptic condition or to the over-zealous purging, labor began at noon and terminated in five hours without assistance. Next morning patient became entirely conscious, and from that time made a steady convalescence.

Discharged on 15th day well: fœtus non-viable and still-born.

TABLE I.—NON-VIABLE CASES IN WHICH THERE WAS NO OBSTETRIC INTERFERENCE.

No. of case.	Age.	No. of pregnancy	Duration of pregnancy.	Condition on entrance.	No. of convulsions bef. ent.	Total no. of a. p. convulsions.	Obstetric treatment.	Results.		Remarks.
								Mother.	Fœtus.	
1	20	1	7 months..	stupid.....	1	1	none..	well..	alive..	Re-admitted at term: normal labor: no eclampsia. Mother and child discharged well.
2	26	1	6 months..	mind clear.	9	11	none..	well..	alive..	Urine abundant, 1018, albumin ¼%.
3	22	1	6–7 months	comatose...	7	8	none..	well..	dead..	Spontaneous premature labor.

Material mortality 0%; fœtal mortality 33%.

In the following group of six cases, in the non-viable period of pregnancy, the patients' condition on entrance was such, or the response to conservative treatment so unsatisfactory, that obstetric interference was indicated:

Case I.—M. D., 16, S., Igravida six to seven months advanced. Vomiting for two days before entrance, legs œdematous, eyesight unaffected. First convulsion nine hours before entrance, followed by twelve more before admission. Urine: ℥ iss by catheter; ½% albumin; hyaline, coarse and fine granular casts, brown granular casts, blood, and cells. Two convulsions directly after entrance, face not dusky, pupils equal but non-responsive to light, pulse 160. Immediate delivery determined on: ether, manual dilatation, podalic version, forceps to after-coming head. Child non-viable, but gasped a few times. After delivery;—hot-air bath, pilocarpin, brandy, digitalis, potass. acetas. Remained unconscious post partum, but no more convulsions; pulse became good, free perspiration. Urine: ℥ xviii in next 24 hours. First spoke after 30 hours, but most of the time semi-unconscious, and not perfectly rational until five days post partum. Slow, but gradual, convalescence.

Discharged well: child non-viable and stillborn.

Case II.—N. R., 19, S., Igravida seven months advanced; well developed. Brought in by a policeman who had seen her in a dozen convulsions. Urine: ℥ iv by catheter; 2% albumin; hyaline, epithelial, and fine granular casts, some free blood. Hot-air bath, pilocarpin, croton oil, ether during convulsions. As the convulsions continued, five occurring since entrance, manual dilatation and podalic version were performed; patient then placed in hot-air bath; pilocarpin, chloral, digitalis, and nitro-glycerine; no more convulsions. Next day, urine ℥ xvi, albumin ½% : steady improvement from this time.

Discharged 15th day well: child non-viable and stillborn.

Case III.—J. McB., 31, M., Igravida 21 weeks advanced; flabby and heavy. For a week had had epigastric pain and nausea: had three convulsions two days before entrance. Urine: ℥ vi; 2% albumin, hyaline casts and some round cells. Blankets and heaters, croton oil, potass. bitartras, digitalis, nitro-glycerine, poultice over kidneys. After nine hours another convulsion, then ether, manual dilatation and podalic version: recovery uninterrupted.

Discharged well: child non-viable and stillborn.

Case IV.—A. H., 20, M., Igravida five to six months advanced. History of one convulsion 24 hours before entrance, preceded by headache. Entered profoundly comatose, with stertorous respiration and dry skin: tongue and lips swollen and bloody. Urine: ʒi by catheter (not examined). Pilocarpin gr. $\frac{1}{8}$, repeated in half an hour; hot-air bath: free sudoresis and salivation in 55 minutes, but diminished in an hour and pulse rose to 185: brandy sub cutaneously. Seen by visiting physician half an hour later; delivery decided upon: cervix hard, os rigid, manual dilatation impossible until cervix was incised; small dead fœtus delivered by podalic version in 50 minutes. After delivery condition markedly improved; color good, respiration easy, skin moist. No well marked eclampsia after delivery, but typical convulsions occurred every 20 to 30 minutes from entrance until uterus was emptied. Able to swallow 1½ hours post partum, and was given bromide and chloral to control restlessness, potass. acet. gr. xx every two hours, milk and cream of tartar water freely; bowels moved with croton oil gtt. ii. Almost entire suppression of urine until 12 hours after entrance and eight hours post partum, when ʒ vii were obtained by catheter and ʒ vi six hours later. Nine hours post partum skin became dry, color bad, pulse rapid and irregular, breathing stertorous, lungs œdematous; brandy, digitalis, and ammonii carb. Death 26½ hours after entrance.

Discharged dead: child non-viable and stillborn.

Case V.—M. C., 42, M., XIIgravida six to seven months advanced. A hard drinker. Has had vomiting, headache, diarrhœa, and impaired eyesight for two months. Two convulsions before entrance: legs œdematous, mind cloudy for past two days. Urine: ʒ viii in bladder; trace of albumin, blood, hyaline and fine granular casts. It was decided to deliver: ether, manual dilatation, podalic version; child non-viable, but gasped a few times. After delivery:—hot sponge bath, blankets and heaters, pilocarpin,—followed by free sudoresis. Restless and delirious; slight bilateral facial paralysis. No post partum convulsions. Brandy and digitalis p. r. n.; ice-cap to head. Temperature rose to 104.6° F., gradually failed, and died thirty hours after entrance.

Discharged dead: child non-viable and stillborn.

Case VI.—L. R., 35, M., ?gravida six months advanced. History of ten or more convulsions in preceding 12 hours, with pre-

vious headache and vomiting. On entrance patient unconscious, restless, skin dry. Urine: small quantity, much albumin. Given pilocarpin and placed in heaters by house physician. Visiting physician decided to deliver: ether, manual dilatation, and extraction by the foot. Under pilocarpin profuse sudoresis and salivation. Able to swallow two hours post partum, and given potass. acet. gr. xx every two hours. Pulse weakened, respiration became rapid and skin dry: pilocarpin guarded by brandy caused free sudoresis and improved respiration. Urine: only a few drachms, ⅛% albumin. Eleven hours post partum respiration 50 to 60: croton oil and enemata. Pulmonary œdema. Temperature 103.4° F. Pulse gradually weakened, and death ensued 16 hours after entrance.

Discharged dead: child non-viable and stillborn.

TABLE II.—NON-VIABLE CASES IN WHICH LABOR WAS INDUCED.

No. of case.	Age.	No. of pregnancy.	Duration of pregnancy.	Condition on entrance.	No. of convulsions before entrance.	Total no. of convulsions.		Obstetric treatment.	Results.		Remarks.
						ante-partum.	post-partum.		Mother.	Fœtus.	
1	16	1	6–7 months	comatose.	13	15	0	man. dil.. version.	well...	still-born.	Forceps to after-coming head.
2	19	1	7 months..		12	17	0	man. dil., version.	well..	still-born.	
3	31	1	21 weeks..	dull	3	4	0	man. dil., version.	well...	still-born.	
4	20	1	5–6 months	comatose.	1	12	0	cervix incised: version.	dead..	still-born.	Almost entire suppression of urine: death from pulmonary œdema 22½ hours post-partum.
5	42	12	6–7 months	dull...	2	2	0	man. dil., version.	dead..	still-born.	Hard drinker: probably exacerbation of chronic nephritis
6	35	?	6 months..	comatose.	10	10	0	man. dil., version.	dead..	still-born.	Pulmonary œdema. Almost entire suppression of urine.

Maternal mortality 50%: fœtal mortality 100%.

When the eclamptic has reached the period of fœtal viability, there is, of course, much less incentive to delay obstetric interference. In the following group of four primiparæ, three of whom entered hospital comatose, delivery was indicated in the

interest of mother and child. All four were severe cases, two having had 16 and 18 convulsions respectively before entrance:

Case I.—A. K., 20, M., Igravida eight months advanced. 24 hours before entrance was seized with headache; first convulsion six hours later, followed by 18 attacks up to time of admission. Secreted only ℥ iv of urine during 16 hours of day before entrance: entire suppression of urine for six hours just before admission. As the patient was comatose on entrance, and had been subjected to free diaphoresis for six hours without benefit, immediate delivery was decided upon. Ether, manual dilatation, forceps,—fœtus macerated. Placed in hot-air bath for eight hours, with occasional intermissions: morphia gr. ⅛ for three times; but had two convulsions during this time lasting about two minutes each, during which ether was given: very restless, requiring constant slight restraint, not controlled by the morphia given. Was stimulated freely with brandy and digitalis. Five hours post partum conscious enough to swallow, and was given cream of tartar water freely. Eight hours after delivery urine ʒ iiss by catheter. Heart failing: brandy, digitalis and milk. In next six hours secreted urine ʒ v. Bowels moved with elaterium and croton oil. Again placed in hot-air bath for ½ hour, but was removed, as the skin failed to respond and the temperature began to rise and pulse grew weaker. In seven hours, urine ʒ vii. Became deeply comatose, respiration slow and stertorous, temperature rose and pulse failed: death 32 hours after entrance.

Discharged dead: child stillborn and macerated.

Case II.—L. M., 24, M., Igravida 8½ months advanced. Brought to hospital unconscious. For past two weeks œdema of legs, otherwise well until four hours before entrance, when she suddenly complained of blurred eyesight, and directly had a convulsion lasting five minutes: three other convulsions before entrance. Respiration stertorous, pupils normal in size and reaction, œdema of legs and labia majora, fœtal heart not heard. Urine: ℥ xxvii (it was not known how long this had been in the bladder); albumin ¼%, hyaline and fine granular casts. No signs of labor. Placed in hot-air bath, pilocarpin gr. ⅛ subcutaneously. Two hours later, patient having had three more convulsions (during which ether was given), it was decided to deliver. Manual dilatation undertaken, but failed owing to rigidity of the cervix: Barnes' hydrostatic bags also proved inefficient:

uterus catheterized with little result. After three hours, and one more convulsion, manual dilatation again tried without success: uterine catheter replaced, but with only slight reaction. Urine: ℥ v, albumin ¼%. Meanwhile brandy and digitalis subcutaneously, and hot-air bath: free sudoresis. Nine hours after entrance, the pulse being 140, and temperature 104.6°, the cervix was incised and child delivered dead. Mother did not recover consciousness, and died 11 hours after entrance.

Discharged dead: child stillborn.

(The especial interest in this case was the suddenness of invasion of the eclamptic seizure, the failure of response to treatment, and the very unusual difficulty in effecting dilatation and delivery.)

Case III.—N. F., 20, S., Igravida at full term. At entrance unconscious, having had 16 convulsions in the preceding 9½ hours: convulsion caused by catheterization. Seen in half an hour by visiting physician, who decided on immediate delivery. Ether, manual dilatation, forceps: living child delivered 40 minutes after entrance. Patient then placed in hot-air bath, pilocarpin gr. $\frac{1}{10}$, brandy subcutaneously, croton oil gtt. iiss. Convulsions continued. Chloral by rectum, digitalis and brandy sub-cutaneously. Patient continued comatose, œdema of lungs, failed rapidly, and died seven hours after entrance, having had 24 convulsions. Urine (obtained immediately after death): albumin ⅛%, bladder and renal epithelium, hyaline and granular casts, free blood.

Discharged dead: child well.

(The especial interest in this case lies in the fact that the child survived and was born living, after the occurrence of so many as 17 maternal convulsions.)

Case IV.—J. P., 23, S., Igravida at full term. Entered with a history of œdema, almost entire suppression of urine, dizziness, and blindness; soon after had a convulsion lasting about two minutes. Ether. Urine: ℥ ii by catheter, the entire secretion for six hours; coagulating solid with HNO_3. Patient being at full term, it was thought best to deliver: manual dilatation, forceps. Blankets and heaters, pilocarpin gr. ¼, repeated in ½ hour: moderate sweating and considerable salivation. Cream of tartar water ad libitum. Six hours later, urine ℥ iii, albumin 2%, numerous hyaline and fine granular casts. During next six hours urine ℥ v were secreted, and in the next six, ℥ xiii, with

only a trace of albumin in last specimen. During forenoon after delivery complained of blindness of right eye and slight headache. Next day general improvement: 24 hours' urine ℥ xli: was given tr. digitalis ♏ x four times. Next day's urine ℥ xcvi. From this time gradual improvement: urine abundant, slight trace of albumin, no casts.

Discharged in one month well: child well.

TABLE III.—VIABLE CASES IN WHICH LABOR WAS INDUCED.

No of case.	Age.	No. of pregnancy.	Duration of pregnancy.	Condition on entrance.	No. of convulsions before entrance.	Total no. of convul.		Obstetric treatment	Results.		Remarks.
						ante-partum.	post-partum.		Mother.	Fœtus.	
1	20	1	8 months..	comatose.	18	18	2	man. dil., forceps.	dead ..	macerated.	Entire suppression of urine.
2	24	1	8½ m.....	comatose.	4	8	0	version .	dead ..	stillborn.	Incision of cervix.
3	20	1	term	comatose.	16	17	7	man. dil., forceps.	dead ..	well...	
4	23	1	term	œdematous.	0	1	0	man. dil., forceps.	well ..	well...	Almost entire suppression of urine.

Maternal mortality 75%: fœtal mortality 50%.

If all the cases of convulsions occurring in the pre-viable period of pregnancy are grouped together, we have nine cases, seven of whom were primigravidæ. The fœtus was lost, by induced or spontaneous labor, in seven of these cases: in one case, which re-entered at full term, the fœtus was subsequently born alive; and in the remaining case the mother was discharged with an arrest of the eclamptic condition, the fœtus being alive, and she did not re-enter the hospital. Of the nine mothers, seven of whom entered the hospital comatose or with cerebration more or less affected, six were discharged well, and three died,—a mortality of 33⅓%.

If all the ante-partum cases are grouped together, without regard to the duration of pregnancy, we have 13 cases, with a maternal mortality of six, or 46%; and a fœtal loss of nine cases (one fœtus being macerated), or 69%.

INTER-PARTUM ECLAMPSIA.

When the eclamptic seizure occurs during labor, it has been the practice of the hospital to deliver as soon as the visiting

physician could be summoned. It is not believed that the shock of operative interference under anæsthesia unfavorably affects the nervous system; but, on the contrary, that the kidney more quickly recovers its function after the uterus is emptied. After delivery chief reliance is placed on chloral, pilocarpin, hot bathing or the hot-air bath, mild diuretics, and necessary stimulation.

In the following group of eight cases at term, all but one primiparæ, numbers 5 and 7 are especially interesting by contrast: in number 5 the mother survived two inter-partum, and 23 post-partum, convulsions; in number 7, both mother and child were lost after three inter-partum, and one post-partum, seizures. In case 6 there was pelvic deformity requiring craniotomy of the after-coming head, so that the fœtal death was not chargeable to eclampsia; therefore the fœtal mortality in the inter-partum cases fairly attributable to eclampsia was only 12½%.

Case I.—K. D., 37, M., Ipara at full term. Nausea and headache for some time before entrance; but no vertigo, epigastric pain, or œdema. Entered in labor. Urine by catheter: ℥ ii, color high, albumin large trace; was given cream of tartar water freely. First stage tedious. Eleven hours after entrance, without premonitory symptoms, had a convulsion lasting one minute: regained consciousness two minutes later and complained of severe headache. In 40 minutes seen by visiting physician: ether, manual dilatation, podalic version. Skin dry, restless: heaters, potass. acet., cream of tartar water, hot drinks, potass. bromide and chloral by rectum: soon skin became moist, headache less, patient more quiet. Urine: ℥ vi by catheter 4½ hours post partum. In next twelve hours urine ℥ xx, paler, albumin a trace. From this time convalescence.

Discharged well: child well.

Case II.—S. D., 20, M., Ipara at full term. No symptoms of eclampsia on entrance. Urine: ℥ i by catheter, albumin ⅛%. Convulsion lasting three minutes six hours after entrance; during this time patient had secreted urine ℥ xv. Second convulsion in half an hour: ether was given at first symptom of convulsions and apparently modified them. Patient conscious between these two attacks and said she had never had fits before. Labor pains good; os uteri = $1.00. Urine pale, 1021, albumin ¼%, renal cells, abnormal blood corpuscles. Delivery decided on: manual dilatation, podalic version; moderate hæmorrhage post partum.

Heaters, pilocarpin, potass. acetas, hot drinks, cream of tartar water: profuse perspiration. 24 hours post partum had passed urine ℥ xxxviii, albumin faint trace. In three days urine negative.

Discharged well: child well.

Case III.—M. P., 22, S., Ipara at full term. Labor had been in progress for seven hours and nothing abnormal noted, when she was suddenly seized with a convulsion which was followed by a second in ten minutes: breathing stertorous, only partially conscious. Pending the arrival of the visiting physician a third convulsion within an hour. Ether, manual dilatation, podalic version, moderate post-partum hæmorrhage. Semi-conscious: very restless: another convulsion six hours post partum. Urine: scanty, loaded with albumin, hyaline and fine granular casts. Skin dry, semi-comatose. Poultice over kidneys, morphia used with unsatisfactory result, chloral and potass. bromide. Free sudoresis and some sleep. Next morning was rational: given tr. ferri chloridi ♏ x every four hours. Passed urine ℥ lvii in 24 hours following delivery; albumin slight trace. No further urinary symptoms.

Discharged well: child well.

Case IV.—G. S., 17, M., Ipara at full term. Entered at 2 P.M. Urine: 1007, albumin $\frac{1}{8}$%, no casts. Os dilated slowly, some headache, drowsy all next forenoon, vomited at 10 A.M. 12.45 P.M.: convulsion: urine,—smoky, 1030, albumin $\frac{1}{4}$%, hyaline and granular casts, blood. Second convulsion at 1.10 P.M., third at 1.45 P.M., each more severe than preceding. Manual dilatation, forceps, then hot-air bath and pilocarpin; another convulsion in half an hour: much post-partum hæmorrhage. Brandy and ergot. Free sudoresis, but restless. Pilocarpin continued, with potass. acetas and cream of tartar water: confused, but took milk and medicines. Fifth convulsion at 11.30 P.M., failed rapidly and died at 11.40 P.M., nine hours post partum.

Discharged dead: child well.

Case V.—L. R., 18, S., Ipara at full term. A hard drinker. Entered in labor at 9 A.M., but had few pains up to 5 P.M. At 6 P.M. os = $\frac{1}{2}$ inch. At 7 P.M. convulsion, followed very soon by another: ether and heaters. Urine: albumin $\frac{1}{4}$–$\frac{1}{2}$%, fine granular and hyaline casts, blood, and renal cells. Os dilated quickly: forceps. Then pilocarpin, chloral and bromide, potass. acetas, and digitalis. Complained of headache and pain in back and

legs during the night, but slept 4½ hours. Post-partum convulsions occurred at 2.20, 3.40, 5.25, 6.20, 7, 7.20, 7.40, 8, 8.20, 9.15, 9.45, and 10.18 A.M. Urine ʒ xiv. by catheter. Convulsions continued at 11.06, 11.33 A.M., 12 M., 12.12, 2.09, and 8 P.M. All this day heaters, and pilocarpin p. r. n., with free perspiration; took milk Oiv. Convulsions at 9.30 P.M., and 12.50 A.M. next day: chloral, bromide, and pilocarpin. 24 hours' urine ʒ xviii. From this time did well until 1.55 P.M. next day, when another convulsion. Next day, convulsions at 4 and 6.45 A.M., but none thereafter: had in all 23 post-partum convulsions. Convalescence complicated subsequently with a mild attack of delirium tremens: said to have become insane two years afterwards.

Discharged well: child well.

CASE VI.—M. McK., 31, M., Ipara at term. Apparently well on entrance; but after 48 hours of tedious first stage pains (for which she was given chloral and morphia) had a convulsion. Urine: albumin ⅛%, free blood, no casts. Had two more convulsions within 1¼ hours, then ether, manual dilatation, podalic version, and craniotomy on after-coming head (pelvic contraction). No post-partum convulsions.

Discharged well: child dead (craniotomy).

CASE VII.—M. C., 30, W., IIpara at term. No serious symptoms during last few weeks of pregnancy, and went to bed in her home feeling as well as usual. Awakened at 11 P.M. by escape of liquor amnii, when she came to hospital. Anæmic, but no œdema: some headache soon after entrance, and one hour later severe epigastric pain; labor pains moderate and frequent. At 1.55 A.M. a severe convulsion lasting two minutes and followed by unconsciousness. Pulse good; skin cool, but dry: fœtal heart plainly heard: os = 25 cents. Urine: ʒ i, albumin 1%, numerous hyaline and granular casts, free blood. Hot bath for ½ hour. At 2.25 A.M., while in bath, second convulsion lasting one minute. Taken from bath, wrapped in blankets, and surrounded by heaters. At 2.40, skin warm and moist, pulse fair, os = 3 inches. At 2.45, third convulsion, slight (ether during all three convulsions). At 3, seen by visiting physician, who completed delivery with forceps in 15 minutes; slight hæmorrhage: child stillborn. 15 minutes post partum a fourth slight convulsion: pulse weaker: subcutaneous stimulation, chloral and bromide by rectum. Gradually failed and died at 4.43 A.M.,

two hours and 48 minutes from first convulsion. No recovery of consciousness after first convulsion.

Discharged dead: child stillborn.

(This case is a good example of éclampsie foudroyante: the sudden invasion of eclampsia in a woman who considered herself well up to within 1½ hours of her first convulsion and the lethal issue in less than three hours from the first convulsion, with no recovery of consciousness from the first invasion, well exemplify the hopelessness of the affection in some cases. The child was born still after only three convulsions; yet in case 3 of the viable group of ante-partum eclamptics the child was born living after the mother had had 17 convulsions from which she never recovered consciousness.)

Case VIII.—M. K., 18, M., Ipara at term. History of vomiting several times during night before entrance, but no other symptoms. Labor began at 6 A.M.; entered hospital at 9 A.M., mildly delirious, but able to answer questions; pains good, and at short intervals. Had had chloral gr. xxx before entrance; said she had passed no urine since yesterday. Urine by catheter: ʒ ss, albumin ⅛–¼%. Hot bath for 20 minutes had a quieting effect, but soon rendered restless by labor pains, and required some restraint in bed. Well-marked convulsion at 12.45 P.M. lasting five minutes: pilocarpin gr. ⅓, profuse sweating in 20 minutes. Unable to count fingers held before face. 1.30 P.M. very restless: chloral gr. xxx by rectum; vomited all milk. 3.15 skin hot and dry, T. 104.6°: pilocarpin gr. ⅓; sweating in 10 minutes. 3.50 fœtal heart 160: second convulsion; ether. Seen by visiting physician: os ⅜ dilated, head low, membranes ruptured; entire suppression of urine: forceps delivery, child alive; slight hæmorrhage. Good recovery from ether; patient stupid; pulse 152, temperature 105°. Given potass. acetas in large amount of water, digitalis: several sponge baths during night, and at 4 A.M. temperature 100°. Was restless during night, but secreted urine Oi; albumin large trace, numerous hyaline and granular casts, free blood. From this time gradual improvement: urine increased, albumin and casts disappeared.

Discharged (14th day) well: child well.

TABLE IV.—INTER-PARTUM CASES: OPERATIVE DELIVERY.

No. of case.	Age.	No. of pregnancy.	Duration of pregnancy.	Condition on entrance.	Total no. of convul.		Obstetric treatment	Results.		Remarks.
					Inter-partum.	Post-partum		Mother.	Child.	
1	37	1	term..	nausea, headache, albuminuric.	1	0	manual dilata., version.	well.	well.	
2	20	2	term..	albuminuric.	2	0	man. dil., version.	well.	well.	
3	22	1	term..	appar. well..	3	1	man. dil., version.	well.	well.	
4	17	1	term..	albuminuric.	8	2	man. dil., forceps.	dead.	well.	
5	18	1	term..	intemperate, appar. well.	2	28	forceps ...	well.	well	Said to have become insane two years afterwards.
6	31	1	term..	appar. well..	3	0	man. dil., version.	well.	dead.	Deformed pelvis: craniotomy.
7	30	2	term..	considered herself well.	8	1	forceps....	dead.	dead.	
8	18	1	term..	delirious....	2	0	forceps....	well.	well.	Entire suppression of urine.

Maternal mortality 25%: fœtal mortality 25%.

POST-PARTUM ECLAMPSIA.

When the eclamptic seizure first appears post partum, the question of obstetric interference naturally does not arise. It may be thought by some that in the presence of symptoms during labor threatening a convulsive seizure, it is well to terminate the labor artificially, with a view to intercepting a possible attack; and such a course is doubtless advisable in the presence of lingering labor. But when the labor is progressing normally, non-intervention has been the practice in the Boston Lying-in Hospital; and treatment has been directed to allaying nervous symptoms and mildly stimulating the function of the kidney. In numerous cases, not presented in this report, in which symptoms were present which threatened a convulsive seizure, and which were prophylactically treated, eclampsia did not supervene. In general, post-partum eclampsia is treated as in inter-partum cases after the labor is completed.

The following group embraces 15 post-partum cases, 12 of whom were primiparæ: all but one were at full term: there were two cases of twin pregnancy. Only one mother was lost,

she dying of pulmonary œdema. There should, of course, be no fœtal mortality attributable to post-partum eclampsia; but one non-viable fœtus was lost by spontaneous premature labor, and one of the twins died on the third day from unexplained cerebral hæmorrhage.

CASE I.—J. F., 26, M., IIpara. First labor two years ago at her home: had eclampsia (instrumental delivery), followed by complete hemiplegia of right side from which she has never fully recovered. In second pregnancy has been under able medical care: two months ago, at seven months, had a convulsion and urine was found,—albumin ¼%, hyaline and epithelial casts, large amount of free blood. All symptoms had disappeared at time of entrance except the condition of the urine.

Entered in labor at 10.30 P.M. Urine: acid, smoky, albumin ⅛%, 1024, much free blood, renal epithelium; hyaline, granular, and epithelial casts. Labor progressed without incident. At 1 P.M. next day, headache, amaurosis, mental impairment: child born normally at 2 P.M., when headache ceased, eyesight returned, mind cleared, and patient was comfortable. The urine of P.M. was scanty, smoky, albuminous (¼%), and contained considerable blood and casts. 8 P.M., six hours post partum, a convulsion: hot-air bath, pilocarpin guarded with stimulants; perspired moderately in a few minutes: bromide and chloral by rectum, milk and cream of tartar water freely, potass. acetas. Had a comfortable night, but passed but little urine. Next day doing well, mind clear, urine increasing under treatment, albumin small trace, sediment,—some blood and a few casts. Urine gradually increased in amount, and abnormal constituents disappeared. Hemiplegia seems less marked than at entrance. Feels very well.

Discharged well: child well.

CASE II.—M. B., 27, S., Ipara at full term. Entered in labor at 7.45 P.M.: œdema of hands, feet, and legs. Urine: albumin ¼%, 1010, smoky; potass. acetas gr. XX every four hours. Diagnosis of twins: 1st born at 12.55 A.M., 2nd at 1.30 A.M., labor normal. Slept well remainder of night. At 7.30 A.M. a slight convulsion, followed by a second, more violent, at 9 A.M. Urine: ℥ iv; smoky, albumin ¼%, a few hyaline and fine granular casts, blood, renal cells. Hot-air bath, digitalis, cream of tartar water, stimulants: free sudoresis. By 8.45 A.M. of next day had had in all 18 convulsions, most of them severe; uncon-

scious since 3 P.M., but has been able to swallow milk and medicines; has perspired freely, and general condition is still good: ether used freely seemed to stop or lessen the convulsions. Morphia was tried, but seemed to make patient restless and produce cyanosis. Next day convulsions at 9.40 A.M., 12.10 P.M., 1.20 P.M., and the last at 6.45 P.M.: same general treatment. Urine increasing in amount and less smoky. Still recognizes no one, but is quiet, and slept well during night. Gradual improvement: on 13th day urine,—color normal, 1012, acid, albumin trace, occasional blood corpuscle. Had had 22 convulsions in all.

Discharged well: twins discharged well.

CASE III.—L. W., 26, M., IIpara at full term with twins. Normal labor four years ago. Nausea and vomiting throughout second pregnancy, headache, epigastric pain marked during last two days; œdema for some months; urine scanty; eyesight impaired. Physical examination: marked œdema of feet and ankles, slight of face, skin dry, smooth, and velvety, abdomen much distended, knee presentation. Urine: albumin 1%; numerous hyaline and fine granular casts, renal epithelium, some abnormal blood. Given potass. acetas, cream of tartar water, chloral and bromide. First child born normally 3½ hours after entrance, and second soon after. Patient soon complained of headache, and five hours post partum a convulsion lasting two minutes: blankets and heaters, hot drinks, pilocarpin, chloral and bromide. Soon became conscious, profuse diaphoresis, some vomiting. Slept well. In next 12 hours passed urine ℥ xxxvi. Next morning felt well except for slight headache: milk diet and potass. acetas. Next 24 hours urine ℥ xci. No more convulsions. On 4th day first child died in convulsions: autopsy,—cerebral hæmorrhage.

Discharged (18th day) well: 1st twin dead, 2nd twin discharged well.

CASE IV.—J. F., 21, M., Ipara at full term. Phlegmatic temperament, no symptoms of renal disease. Normal labor of only 3¼ hours. Ten hours after labor, without warning, had a convulsion, followed at intervals of about 20 minutes by six more. Urine: 1012, albumin ¼–½%, renal and pelvic epithelial cells, blood, free fat, granular and fatty casts: had passed ℥ xxiv ss between labor and first convulsion. Blankets and heaters, pilocarpin and brandy subcutaneously, croton oil, chloral and bromide by rectum, ether during convulsions. Consciousness

returned about four hours after first convulsion, then given cream of tartar water and potass. acetas. From the return to consciousness she made an uninterrupted recovery: daily amount of urine reached ℥ lxxix, and all medicines omitted.

Discharged (16th day) well: child well.

Case V.—A. J., 19, S., Ipara at term. Had vomited every morning for two weeks before entrance, had had severe headache and some œdema of legs. Two hours after normal labor, severe frontal headache and pain in lumbar and epigastric regions: placed in heaters and given potass. bitart., and potass. acetas; in five hours urine = ℥ viii. Seven hours post partum well-marked convulsion lasting three minutes, skin very dry; became conscious in ten minutes and complained of headache: hot-air bath and pilocarpin. In an hour a second convulsion lasting one minute; soon, however, sudoresis and return of consciousness, but complained of headache and impaired vision. Four hours after first convulsion, urine = ℥ viii, albumin trace; pus, blood, hyaline and fine granular casts, renal cells. Was given calomel and jalap. Gradual improvement, no more convulsions.

Discharged (15th day) well: child well.

Case VI.—F. S., negress, 21, M., Ipara at term. Apparently well on entrance, but nervous. Urine pale, 1007, no albumin, amount normal. 5½ hours after normal labor complained of headache, sleeplessness, epigastric pain; half an hour later found in a convulsion, recovered consciousness soon after. Three hours later, second convulsion. Urine: ℥ iiss, smoky, 1022, albumin ¼%, blood, hyaline and fine granular casts. Hot-air bath for 2½ hours, pilocarpin, cream of tartar water ad libitum, potass. acetas gr. xv every three hours. Improved rapidly.

Discharged (14th day) well: child well.

Case VII.—L. S., 31, M., Ipara at term. Nervous temperament. Labor normal: some nausea and vomiting after 3d stage. Eight hours post partum found in a violent convulsion, followed by coma and stertorous respiration. Urine: ℥ ix, pale; albumin 2%; blood, hyaline, granular, and brown granular, and fatty casts. In 15 minutes 2d convulsion lasting two minutes, during which time only two respirations; patient livid. Hot-air bath and pilocarpin. In next 8 hours seven convulsions, all but one severe: patient livid, lungs became œdematous:

subcutaneous stimulation. Gradually sank and died, after several more slight convulsions, 13 hours post partum.

Discharged dead: child well.

Case VIII.—E. O., 45, M., XIIIpara at term. Feet swollen for several months, otherwise well up to one week before entrance, since when, headache, pain in right hypochondrium, nausea, and occasional vomiting; jaundice for past two days; has been confused at times, and has slept but little for a week. Dull and confused on entrance. Urine: acid, 1014, color greenish-brown, albumin $\frac{1}{8}$%, hyaline, granular, and epithelial casts in abundance, free blood and renal cells. Easy normal labor, followed by slight hæmorrhage. Given cream of tartar water and potass. acetas. Next morning had slept but little, skin hot and dry: pilocarpin gr. $\frac{1}{4}$, followed in 15 minutes by a convulsion with slow recovery. Skin cold and wet, lips blue, pulse weak, respiration rapid: urine in 24 hours = ℥ x. Hot-air bath, brandy subcutaneously. Slept some during the day; occasional vomiting. Next day was restless in A.M. and delirious in P.M. Urine ℥ xviii in 24 hours, same constituents. Elaterium and pilocarpin. From this time steady improvement; but had some trouble with eyes, œdema of retina by ophthalmoscope. Urine gradually cleared.

Discharged well: child well.

Case IX.—M. H., 23, S., Ipara at term. Hydramnios, slight œdema of labia. Labor normal. Next morning severe vomiting; urine has large trace of albumin. At 6 A.M. patient dazed; lips blue; pulse 50–60, weak and irregular; pain in head and chest. 8.10 A.M. convulsion. Urine: ℥ iss, smoky, albumin $\frac{1}{8}$%, hyaline, granular, and epithelial casts in abundance, renal epithelium and blood. 8.30 A.M. croton oil gtt. ii, pilocarpin gr. $\frac{1}{8}$, hot-air bath. In 15 minutes free sudoresis. 10.40 A.M. croton oil gtt. ii, pilocarpin gr. $\frac{1}{8}$, potass. acetas. 11.40 A.M. 2d convulsion, longer and more severe than the first: urine by catheter = ℥ ii. 1.20 P.M. vomited freely. To have potass. acetas gr. xx every two hours, cream of tartar water ad libitum; pilocarpin gr. $\frac{1}{4}$ at 1.30 and 4.45 P.M. Calomel gr. x in divided doses. Sweat profusely and had free watery dejections: more comfortable at night, no headache: passed urine ℥ lv during night, vomited once. Next day hot-air bath omitted: to have sponge bathing. From this time diuretics diminished: patient gradually improved, and on 15th day urine contained albumin a trace and no casts.

Discharged well: child well.

Case X.—M. F., 20, S., Ipara at term. On entrance: marked œdema of legs and labia; urine;—albumin trace, no casts. Normal easy labor, after which urine found to contain albumin trace, hyaline and fine granular casts. Two hours post partum had a convulsion, short, but followed by unconsciousness; skin dry, respiration stertorous: heaters, pilocarpin gr. $\frac{1}{8}$ repeated in $\frac{1}{2}$ hour;—free sudoresis. Three hours later second convulsion without premonition: pilocarpin repeated, followed by profuse sweating. Some headache, but slept fairly well. Next day urine = ℥ l, containing hyaline, granular, and epithelial casts, and a few fatty casts. From this time uninterrupted recovery. On 19th day no casts and no albumin in urine.

Discharged well: child well.

Case XI.—E. F., 18, S., Ipara at term. Apparently well on entrance. Had chloral in 1st stage; labor normal, moderate post-partum hæmorrhage. Severe headache after labor, and in four hours a convulsion lasting from two to three minutes; skin hot and dry. Urine: 1030, albumin $\frac{1}{2}$%; numerous hyaline, fine granular, and fatty casts, free blood, and renal cells. There was no œdema. Roused with some difficulty: complained only of headache. Heaters and pilocarpin: profuse perspiration in 15 minutes. In two hours a second convulsion lasting three to four minutes: face cyanotic, muscles all twitching, but leg and arm muscles involved to less extent than in first convulsion. Ether given during attack. Some twitching of eye muscles, but consciousness recovered in $2\frac{1}{2}$ hours. Complained of thirst, and was given cream of tartar water ad libitum, and potass. acetas gr. xx every three hours. Urine still scanty, albumin $\frac{1}{2}$%. Chloral and bromide caused sleep, but she occasionally waked with hallucinations of sight and hearing: answered questions intelligently. Gradually recovered, no more convulsions, urine cleared.

Discharged (16th day) well: child well.

Case XII.—E. B., 21, S., Ipara six months advanced. Apparently well on entrance, but in midst of miscarriage. Labor rapid and uneventful. Patient seemed to be doing well until two hours post partum, when she suddenly had a convulsion: afterwards stupid and could not see fingers held before face; vomited; skin dry. Urine: ℥ i, albumin 1%, no casts found, but some pus. Vomited everything given by mouth and re-

jected enemata. Almost entire suppression of urine; only ℥ i in 9½ hours; but under treatment profuse diaphoresis, vomiting ceased, had no more convulsions, and function of kidney was restored: urine became normal. Convalescence delayed by severe lumbar pain.

Discharged (52d day) well: child non-viable and stillborn.

Case XIII.—L. D., 21, M., Ipara at term. Œdema of legs on entrance. Urine: albumin 1%, epithelial cells and casts. Labor normal: four hours afterwards a general clonic and tonic convulsion lasting seven minutes. On return of consciousness complained only of severe frontal headache. There was no history of any previous convulsions. Improved under treatment, and urine increased to ℥ l. Had occasional headaches, otherwise convalescence uninterrupted. At time of discharge urine was still albuminous, but contained no casts and no blood.

Discharged (14th day) well: child well.

Case XIV.—L. L., 36, M., Ipara at term. During latter part of pregnancy complained of a "tired feeling in her eyes" and slight dizziness; ankles œdematous, face puffy. Very irritable and nervous during labor, which was normal. Passed urine (containing albumin a trace) frequently and in normal quantities. Had a comfortable night, but 8 hours post-partum had a severe convulsion, controlled with ether. Two hours later a second, extremely severe, typical convulsion, arrested with ether. Urine: ℥ xxvi in 12 hours; albumin ⅛%, fine granular casts. Skin dry. Six hours later urine = ℥ viii, albumin ⅛%, numerous hyaline and fine granular casts, and a few brown granular casts; small amount of blood. Under usual treatment œdema disappeared; next 24 hours' urine = ℥ lvii, albumin trace, no casts, but apparently the detritus of broken down casts. Urine gradually cleared, no more convulsions.

Discharged (14th day) well: child well.

Case XV.—M. M., 23, S., Ipara at term. On entrance feet œdematous, but she passed a large amount of urine during 1st stage of labor. Labor normal. In 2d stage, urine by catheter ℥ iv: albumin ⅛%, blood and cells, no casts. During labor was given potass. acetas every three hours and cream of tartar water. There was a sharp post-partum hæmorrhage. Fifteen minutes post partum there was a slight convulsion: at once placed in heaters, pilocarpin and brandy, chloral and bromide. There were two more convulsions at three hour intervals. Croton oil

caused free, watery, involuntary dejections: patient very restless; vomited everything. Next day was still restless until 2 P.M., after which slept well under chloral and bromide. Twenty-four hours' urine = ℥ xxiv, albumin diminished. Perspires freely and feels well except for occasional restlessness. From this time gradual improvement: no more convulsions; urine cleared.

Discharged (14th day) well: child well.

TABLE V.—POST-PARTUM CASES.

No. of case.	Age.	No. of pregnancy	Duration of pregnancy.	Condition on entrance.	Labor.	No. of post-partum convulsions.	Results.		Remarks.
							Mother.	Child.	
1	26	2	term.	renal symptoms.	N	1	well..	well ..	Had eclampsia in 1st preg. followed by hemiplegia.
2	27	1	term.	ditto.....	N	22	well..	well well	Twins.
3	26	2	term.	prodromal symp. of E.	N	1	well..	dead well	Twins: 1st child died of cerebral hæmorrhage.
4	21	1	term.	apparently well.	N	7	well..	well ..	
5	19	1	term.	vomiting, headache, œdema.	N	2	well..	well ..	
6	21	1	term.	apparently well.	N	2	well..	well ..	
7	31	1	term.	ditto.....	N	12	dead..	well ..	Œdema of lungs.
8	45	13	term.	renal symptoms, dull.	N	1	well..	well .	
9	23	1	term.	œdema.....	N	2	well..	well .	
10	20	1	term.	œdema.....	N	2	well..	well ..	
11	18	1	term.	apparently well.	N	2	well..	well ..	
12	21	1	6 mos	ditto	N	1	well..	dead..	Child non-viable. Acute suppression of urine.
13	21	1	term.	œdema.	N	1	well.	well ..	Urine albuminous when patient was discharged.
14	36	1	term.	nervous, œdematous	N	2	well..	well ..	
15	23	1	term.	œdematous..	N	3	well..	well ..	

Maternal mortality 6⅔%; fœtal mortality 12%. But the fœtal loss was due to: 1. Cerebral hæmorrhage, 3d day; 2. Non-viability.

GENERAL RESULTS.

If all the cases presented in this report are grouped together with a view to ascertaining the general percentages in results it will be seen that of the 36 cases, 27 mothers were discharged, well and 9 died,—a maternal mortality of 25%. In ascertaining

the fœtal mortality, if only the ante-partum and inter-partum cases are considered, it appears that of 21 viable and non-viable infants 11 were lost,—a fœtal mortality of 52%; but if the nine non-viable children are excluded, the fœtal mortality is only 33⅓%. If the post-partum cases are grouped with the ante-partum and inter-partum, there is a fœtal loss, from all causes, of 13 cases in 38 (two cases of twins),—a fœtal mortality of 34%: and if only the viable children are considered, the fœtal loss is 5 cases in 28, or a mortality of only 18%.

GENERAL OBSERVATIONS.

In regard to the frequency of post-partum hæmorrhage after eclampsia, the hospital records do not systematically note the presence or absence of bleeding in these cases, and are therefore valueless for statistical purposes in this respect. My own impression is, however, that hæmorrhage occurred in many of the eclamptic cases: it has been the practice of the staff not to hasten to check bleeding in these cases, in the belief that the lowered blood tension, consequent on a reasonable hæmorrhage, is favorable to the recovery of the patient.

The relation to maternal results of the number of convulsions in any given case, as shown in the statistics above recorded, is as follows: The 27 mothers who recovered had from one to 25 convulsions respectively; and the nine who died, from two to 24. Or, by averages, those who recovered had 5.3 convulsions; and those who died, 10.8, or more than twice as many. The prognosis in any given case, however, appears to depend more upon the time when the convulsions occur, upon their severity and frequency, upon the length of the labor, the depth of the coma, and the degree of kidney insufficiency, than upon the number of convulsions.

The relation of the number of convulsions to the fœtal prognosis is of practical importance, as the question of obstetric interference, when the child is viable, should depend, in part at least, on the probable ability of the child to withstand the dangers of repeated convulsive attacks of the mother. Of 10 ante-partum and inter-partum cases, in which the child was viable, (one case is rejected because the child was macerated, and one because craniotomy was performed on account of pelvic deformity), eight children were born living after an average of 3.9 maternal convulsions; and two dead, after an average of

5.5 convulsions. One child was born dead, however, after three maternal convulsions; and one survived 17 maternal attacks, and was delivered alive while the mother was comatose.

The above recorded cases are too few for deductions of value in this particular; but it may be said that the fœtal prognosis depends rather upon the frequency, duration, and severity, than upon the number, of the maternal convulsions.

Whether or not the methods and results of the Boston Lying-in Hospital in the management of puerperal eclampsia are thought to be satisfactory, the fact remains that the affection is one of the most serious complications of childbearing. And if the experience of this hospital teaches nothing else, it surely points to the desirability of preventing, or adequately ameliorating, the conditions which, if unchecked, often culminate in the eclamptic seizure. Certain it is that if the various prodromal symptoms,—the disturbances of sight and hearing, headache, nausea and vomiting, epigastric pain, œdemas, and evidences of impaired renal function, are promptly recognized and treated, puerperal convulsions will occur much less frequently, and one of the greatest perils of maternity will be to a great degree removed. Surely there is an important task for preventive medicine in the prophylactic treatment of puerperal eclampsia.

78 MARLBOROUGH STREET.

TUBAL AND PERITONEAL TUBERCULOSIS.[1]

BY

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WHILE tubercular disease of the internal female generative organs and peritoneum has long been noted and accurately described, it is only within a comparatively short time that its importance has begun to be appreciated by the profession. This change has been wrought by the recent advances made in pelvic and abdominal surgery, which also have been largely instru-

[1] Read before the Michigan State Medical Society, May 12th, 1893.

mental in placing the treatment of the condition upon a scientific basis.

As an example of the increase of knowledge to be derived from systematic work in one direction, one need only turn to the results reported by Williams at the Johns Hopkins Hospital. In his admirable monograph [1] it is stated that the tubes and ovaries removed for all causes in one hundred and thirty-seven laparatomies at the hospital were subjected to a careful microscopical examination. Five cases, besides the two noted at the time of the operation, were found to present the lesions of tuberculosis. From these cases, which he characterizes as cases of "unsuspected tuberculosis," he draws the natural inference that genital tuberculosis is of far more frequent occurrence than has hitherto been suspected.

The writer had arrived at the same conclusion in regard to the frequency of tubal and peritoneal tuberculosis, not from cases of unsuspected tuberculosis as revealed by the microscope, but from the relatively large number of cases of tubercular disease, easily diagnosed from the macroscopical appearances, met with in the course of forty laparatomies performed during the past two years and a half. And although the question of the frequency with which the disease is met with in females may practically be said to have been settled by the results as reported by Williams, it has been considered best to place upon record four cases of tubal and peritoneal tuberculosis, with the hope that their histories and the practical lessons they have taught the writer may prove of some value.

Osler's monograph [2] upon tubercular peritonitis, and that of Williams to which reference has been made, are so exhaustive, and present so well the existing knowledge upon the subject, that a review of the literature is rendered unnecessary. It will suffice, therefore, to present for your consideration three conclusions arrived at from a study of the reported cases, in conjunction with the perusal of the accessible literature upon the subject:

1. Tubal tuberculosis, either alone or with co-existing involvement of the peritoneum, is of far more frequent occurrence than is commonly supposed.

[1] "Tuberculosis of the Female Generative Organs," Johns Hopkins Hospital Reports, vol. iii., Nos. 1, 2, and 3, 1892.

[2] "Tubercular Peritonitis," Johns Hopkins Hospital Reports, vol. ii., No. 2, 1890.

2. Early operative interference is indicated in the presence of either tubal or peritoneal tuberculosis, as a safeguard against the further extension of the disease.

3. All cases of tubal or peritoneal tuberculosis subjected to a laparatomy should be drained, and, whenever practicable, the iodoform gauze drain should be employed.

1. *Frequency of Tubal or Tubo-peritoneal Tuberculosis.*—Inasmuch as all four of the cases to be reported had both tubal and peritoneal tuberculosis, the consideration of the frequency of tubercular peritonitis alone will be purposely omitted.

Williams' statistics in regard to the frequency of genital tuberculosis are most interesting. He states that Edebohls met with "6 cases in 157 laparatomies for all causes, or 4 per cent; Martin, 9 cases in 287 operations, or 3 per cent; and in 137 laparatomies performed at the Johns Hopkins Hospital, a tubercular condition of the genitals was noted in 2 cases, or 1½ per cent." But this is very far from showing the true proportion of the cases affected, for, besides the 2 cases noted at the time of the operation, 5 cases of "unsuspected tuberculosis" were revealed by the microscopical examination of the specimens. Taking into consideration only those cases where the tubes and ovaries were removed for pathological lesions—91 cases—tubercular disease existed in 7.7 per cent. The same statistical method applied to Edebohls' cases shows tuberculosis present in 6 out of 62 cases, or 10 per cent, no cases of "unsuspected tuberculosis" being demonstrated. In summing up his conclusions the author says: "Whatever the proportion of 'unsuspected tuberculosis' in his material may be, his figures and ours at once raise the disease to a very important position from a pathological standpoint, and prove that it is of far more frequent occurrence than was ever suspected, and that it is deserving of practical attention on the part of gynecologists."

A review of the writer's cases is interesting in this connection. Out of a total of 40 laparatomies for all causes, 4, or 10 per cent, were found to have genital and peritoneal tuberculosis. Considering only the 33 cases which were operated upon for chronic disease of the appendages, tuberculosis was present in 12 per cent, a greater proportion than in either Williams' or Edebohls' cases. While the actual number of cases is not large, the relative proportion is surprisingly so, and forced upon the

operator's mind the conviction that the disease was far more prevalent than he, at least, had been led to believe.

It is to be regretted that all the specimens removed were not subjected to as thorough an examination as were those at the Johns Hopkins Hospital, for undoubtedly such an examination would have revealed cases of "unsuspected tuberculosis."

2. *Early Operative Interference Indicated.*—The danger of the extension of a local tubercular affection either of the appendages or peritoneum is conceded to be considerable. It is estimated that in from 30 to 40 per cent of cases of tubercular peritonitis in the female there is an accompanying affection of the appendages. From their anatomical position the tubes are particularly exposed to the dangers of secondary infection, and this is borne out by the fact that the fimbriated extremities in nearly all instances are the first affected. Hence it is obvious that early operative interference is especially indicated in the first stage of tubercular peritonitis, and it is here that the best results are obtained. Osler, in speaking of the benefit to be derived from the operative measures in tubercular peritonitis, says: "Undoubtedly the cases of the first group, those with fresh eruption and considerable effusion, whether free or sacculated, offer the best chance of recovery, as the disease is more likely to be primary in the peritoneum, the general condition is usually better, and the subsequent chances of general infection are much slighter. When the Fallopian tubes are extensively diseased, and when the process has extended through the diaphragm to the pleura, the condition is of course less favorable." The diagnosis is often very obscure and often impossible to be arrived at definitely. If, then, the best results are to be obtained, an early exploratory operation should be made in the presence of obscure abdominal symptoms and a tubercular family history. Such an operation is comparatively safe, and a postponement of surgical interference may mean secondary infection of the appendages and a poorer chance of the patient's recovery.

The accumulative evidence of the past ten years leaves no doubt as to the efficacy of the treatment of tubercular peritonitis by laparatomy and drainage. Whether the beneficial effects of the operation be through the drying of the peritoneal cavity by means of thorough drainage, as claimed by some, or through the exposure of the tubercles to direct sunlight, as claimed by

others, are questions which cannot be answered definitely at the present time. Whatever may be the reason, the fact remains the same, that tuberculosis of the peritoneum shows a tendency to decrease, and even cease, after a laparatomy and drainage. In the presence of these facts the surgeon's duty is clear. Open the abdomen and drain, making use of irrigation or not, according to circumstances.

The treatment of tubercular disease of the appendages will evidently vary according to whether they alone are affected or whether the peritoneum is also the seat of the disease. If the latter be the case, while the diseased appendages should be removed if possible, the patient's strength may have become so impaired by the peritoneal condition that it may be found inadvisable to subject her to the additional shock attendant upon the removal of densely adherent tubes and ovaries. Under these circumstances the treatment should be limited to the tubercular peritonitis, with the hope that the general condition will be improved so as to allow of a subsequent enucleation of the appendages. Edebohls[1] mentions a case where such a course was pursued and the appendages subsequently removed with good result.

In dealing with the cases where the tubercular process is limited to the appendages, the statistics quoted above are of great import to the gynecologist. If, as it would seem, there is such great liability of chronic disease of the appendages being tubercular, with the well-known difficulties of diagnosis in the absence of tuberculosis elsewhere, the indications for the removal of such organs are greatly increased. This possibility of the presence of "unsuspected tuberculosis" should be given careful consideration when the advisability of the removal of tubes and ovaries, long the seat of disease, is under discussion. A tubercular family history may be the one factor which would make us decide in favor of radical measures and against palliative treatment. The impossibility of determining the presence of tuberculosis of the appendages by gross appearances is well illustrated by Williams' reported cases, and this factor should have great weight, in the presence of a marked tubercular tendency, in determining at the operation upon the advisability of the removal of a diseased organ. With the possibility of the

[1] "Tubal and Peritoneal Tuberculosis," Transactions of the American Gynecological Society, 1891.

existence of such a fatal disease as tuberculosis, there is a liability, under some circumstances, of the attempt at saving an appendage being carried too far and the patient's life unnecessarily exposed to the subsequent dangers of general tuberculosis.

Senn[1] states that "a catarrhal condition of the mucous membrane lining the tube, as in other organs, undoubtedly furnishes, in many instances, the *locus minoris resistentiæ* for the localization of bacilli brought to the part through the circulating blood." This would seem to offer further proof why, in some cases where a decided constitutional tendency toward tuberculosis exists, the so-called conservative treatment of diseased appendages by means of the hot-water douche, glycerin tampon, and electricity should be pursued with clear ideas existing in regard to the danger of the advent of general tuberculosis. While every effort should be made to save rather than sacrifice organs, a keen and just discrimination should be exercised in the selection of the cases where the conservative treatment will be attended by the least risks, and, wherever indicated, radical measures should be promptly undertaken.

3. *The Advantages of the Iodoform Gauze Drain after a Laparatomy for Tubal or Peritoneal Tuberculosis.*—In the class of cases under consideration iodoform gauze possesses many advantages over the glass drainage tube. Where tubercular peritonitis with effusion is treated by means of laparatomy, the greatest benefit is derived from the extraction of large quantities of fluid from the abdominal cavity, and, by keeping the peritoneum as dry as possible, affording the poorest soil for the growth of the tubercles. This is best accomplished by means of the gauze drain, for the reason that it removes far more fluid in a given time than does the glass tube. The reason is apparent if we consider that the gauze, packed into the posterior cul-de-sac, presents far more and a better surface for drainage than does the tube. Both are soon shut off from the general peritoneal cavity by adhesions, but the track of the tube is smaller and affords a much narrower avenue for the escape of the fluid. Wherever, other things being equal, there is imperfect drainage after a laparatomy, there will be found more or less increase of temperature. As a rule the temperatures where gauze is used are much lower and would indicate that the drainage is better. If necessary, the gauze drain

[1] "Principles of Surgery," p. 538.

can be supplanted later by the tube, and drainage continued for a longer time than if the tube had been used first.

The best results would seem to have followed the use of aseptic rather than antiseptic fluids for washing out the abdominal cavity, yet the temptation is great, in the presence of tubercles, to make use of some germicide. The dusting of the tubercle-studded peritoneum with iodoform powder is practised by some, but is open to the objection that the amount of powder which will be absorbed cannot be estimated and poisoning might result. In the use of the iodoform gauze we have a better, though hardly an ideal, method of treating the tubercles directly.

This is especially the case where the appendages are the seat of tubercular disease, either alone or with the involvement of the adjacent portions of the peritoneum. Here the gauze drain is seen at its best. It withdraws large quantities of fluid, acts directly upon the tubercles remaining behind in the pelvis, and prevents the caseous material which it has been found impossible to remove from coming into contact with the uncontaminated intestine. All these are distinctly advantageous and go far to offset the principal disadvantage of the gauze drain—namely, the longer convalescence necessitated by the gradual healing of the granulating surface left after the removal of the gauze. However, this and the greater danger of subsequent hernia should have but little weight against the benefits to be derived from its use.

The diagnosis of tubercular disease of the appendages and peritoneum was readily made in each of the following four cases by the macroscopical appearances.

In two cases (1 and 3) the diagnosis was confirmed by a microscopical examination. None of the cases can be placed in the category of "unsuspected tuberculosis," as the diagnosis was made in each case at the time of the operation. While the additional proofs of tubercular disease afforded by the demonstration of the tubercle bacilli were not sought for, the gross appearances of the two cases (2 and 4) not examined microscopically were such as to leave no doubt as to the correctness of the diagnosis.

Case I. *Tuberculosis of Appendages; Caseous Degeneration of Omentum and Intestinal Wall; Operation; Death on third day from Exhaustion.*—R. B., colored, age 21, single, a servant by occupation, entered the gynecological service of St. Mark's

Hospital April 14th, 1892. She had always been well up to last fall, when she contracted gonorrhea. Has never been free from a purulent discharge since that time, and has had constant and steadily increasing pain through both groins, but has never been compelled to give up work until two weeks before entrance. Has had considerable fever and occasional chills, and has lost much flesh. No satisfactory family history could be obtained.

The examination at entrance showed a hard, irregular, sensitive mass filling up the entire right pelvis. The uterus was pushed to the left and only slightly movable. The left tube and ovary could not be mapped out because of the extreme sensitiveness. Diagnosis, pyosalpinx.

The patient was kept under observation for about two weeks after entrance, and an endeavor made to build up the general health before the enucleation of the appendages was attempted. During this time the temperature fluctuated between 98.4° and 102°. A slight cough without expectoration existed, but an examination of the lungs failed to reveal any consolidation. The appetite remained poor and vomiting was a troublesome symptom.

April 19th, 1892, the abdomen was opened in the median line, and the greatly thickened and caseous omentum was found closely adherent to the abdominal wall and intestines. The contents of the pelvis were matted together and united to the intestines by dense adhesions. The thickened right tube was found rolled up under the broad ligament. The latter was much softened, and the caseous material extended even to the outer wall of the pelvis. The right ovary was enlarged to nearly twice the natural size and presented all the evidences of chronic inflammation. The left tube and ovary were very much enlarged, and the lumen of the tube contained thick pus. Small miliary tubercles could be seen scattered over the surface of both tubes. Both appendages and as much as possible of the caseous right broad ligament were removed. In attempting to separate the softened omentum from the intestine the wall of the latter was penetrated, rendering an excision of nearly two inches of the gut necessary. This procedure prolonged the operation, and the patient was removed from the operating table in a poor condition. The pelvis was packed with iodoform gauze and drainage secured through the lower portion of the incision. Every attempt was made to rally the patient, but, although by stimulation she was

kept alive for three days, reaction failed to set in and death followed.

At the autopsy a purulent bronchitis with double adhesive pleurisy was found. No signs of peritonitis existed, and the excised ends of the gut had firmly united. A microscopical examination of the specimens showed tubercular salpingitis and ovaritis.

It is impossible to determine in this case whether the primary inflammatory process was produced by the tubercle bacilli or the gonococci, although the history would point strongly toward the latter as the probable cause and that the tubercle bacilli were deposited subsequently in organs already weakened by disease. The patient's lack of intelligence rendered a complete history impossible, else important testimony in regard to the pulmonary complication might have been obtained. There is every reason to believe that an earlier operation, before the advent of what was evidently the beginning of a general tuberculosis, would have been the means of saving the patient's life.

CASE II. *Miliary Tuberculosis of Peritoneum, Tubes, and Ovaries; Exploratory Laparatomy; Recovery; Death some weeks later following Secondary Operation for Removal of the Appendages.*—Miss I., age 22, American, a servant by occupation, referred by Dr. Walkley, of Grand Haven. The family history was negative. Patient has never been in good health since receiving a severe blow upon the abdomen four years ago. Has never had any pelvic trouble until after accident, since which time there has been steadily increasing pain in lower abdomen. Eleven weeks prior to admittance to the hospital the pain and tenderness increased and she noticed a hard "lump" in left ovarian region. Lately this has subsided and a hard, tender swelling has appeared upon right side. Has had considerable fever and a number of severe chills. Has had no cough, but has lost a great deal of flesh.

Patient was admitted with a temperature of 101° and a pulse of 110. Examination showed great emaciation. The right iliac region contained a hard mass extending downward into the pelvis. A vaginal examination showed the uterus pushed toward the left and but slightly movable. Hard, sensitive masses to be felt on either side of uterus. A diagnosis of double pyosalpinx was made and removal of the appendages advised.

Operation August 15th, 1892. The peritoneum was found greatly thickened and injected, and as soon as the abdomen was

opened a considerable quantity of colorless fluid escaped. A loop of intestine presenting at the wound was seen to be thickly covered with miliary tubercles. The incision was enlarged and the intestines found to be adherent to each other and the abdominal wall. The miliary tubercles were thickly scattered over the parietal peritoneum, intestines, and the hard masses to the right and left of the uterus.

In view of the weak condition of the patient, it was decided to make the operation simply exploratory, as it was feared that the enucleation of the appendages in the presence of the dense adhesions would prove fatal. As the abdominal contents had not been disturbed, no irrigation or drainage was used. The incision was closed with silkworm-gut sutures and the usual dressing applied.

The beneficial effects of the operation were very marked until the stitches were removed upon the seventh day, the wound healing by first intention. The pain and fever disappeared after the operation, the appetite returned, and the patient became confident of her permanent recovery. The day following the removal of the stitches the temperature rose and tenderness along the line of incision became marked. A few days later a circumscribed, intraperitoneal abscess was opened through the abdominal wound and some ounces of foul-smelling pus evacuated. The abscess cavity, which was four inches in depth, was thoroughly irrigated and packed with gauze. Five days later the patient, upon being told by her friends the nature of her trouble, became discouraged and insisted upon leaving the hospital. She was operated upon some weeks later for removal of the appendages by a physician who took charge of the case after she left the hospital, but survived the operation only a few hours.

While, on account of the extensive character of the disease, the ultimate result of this case would probably have been the same, added experience would now lead the writer to adopt a different method of procedure than the one selected. The patient's weak condition and the amount of disease present made it appear best to the operator and those present to make the operation simply exploratory, and therefore drainage was not instituted. This should have been done, with the hope of the peritonitis being so far mitigated as to allow of an enucleation of the appendages at a subsequent operation. While this result

could hardly have been looked for, it would have been better surgery to have made the attempt.

One symptom was especially prominent in this case, namely, the intense thirst, which far exceeded that commonly met with after a laparatomy. Tait[1] calls attention to thirst after the opening of the peritoneal cavity as a sign that "some emphatic physiological change" is taking place. Greater and more inexplicable changes follow the opening of the peritoneal cavity for tubercular peritonitis than in other intra-abdominal disease subjected to the same treatment. The reason why, in the presence of the tubercles, this thirst, as an indicator of the physiological change, is greater, has never been thus far satisfactorily explained.

Case III. *Miliary Tuberculosis of Peritoneum; Tubercular Pyosalpinx; Removal of Appendages; Recovery.*—Mrs. S., age 29, married four years, never pregnant. Family history negative. Began to menstruate at the age of 12 and was healthy until two years ago, when she had an ischio-rectal abscess, resulting in a fistula in ano which never healed. Nine weeks previous to her entrance to St. Mark's Hospital she became very ill and suffered greatly from severe pains in the lower portion of the abdomen. The pain was most severe in the right ovarian region. Previous to entrance she was treated for three weeks for typhoid fever. Bowels obstinately constipated and appetite poor.

Not improving under the typhoid treatment, she consulted Dr. J. A. De Vore, who at once recognized the acute pelvic inflammation and kindly referred the case to the writer.

September 26th the patient was chloroformed and a thorough examination made. The entire pelvis was filled with a hard, irregular mass, in which the uterus was immovably fixed. Although no fluctuation could be made out, a diagnosis of pyosalpinx, probably tubercular in origin, was made, and a removal of the appendages advised.

At the operation on the following day, upon opening the peritoneal cavity the entire right pelvis was found to be filled with a fluctuating tumor the size of a cocoanut, to which the omentum was closely adherent. After protecting the intestines with sponges the cyst was tapped and six ounces of foul-smelling pus evacuated. The cyst was rapidly separated from its

[1] Edinburgh Medical Journal, November and December, 1889.

adhesions and found to be the dilated right tube. The inflammatory process had attacked the broad ligament, and even the right wall of the pelvis, where, instead of normal tissue, there existed a softened, caseous mass. This it proved impossible to remove entirely, although a curette was employed for this purpose. In separating the dense adhesions binding the abscess to the posterior cul-de-sac a second pocket was opened, allowing the escape of a large quantity of pus into the general peritoneal cavity. The left tube and ovary, which were enlarged and thickened and closely adherent to the bowel, were removed. The abdomen was flooded with large quantities of sterilized water, and the pelvis packed with iodoform gauze after the method of Mikulicz. In this manner the intestines were prevented from coming in contact with the remains of the softened and caseous broad ligament. The walls of the abscess cavity were seen to be covered with small, whitish points, which a subsequent microscopical examination showed to be miliary tubercles. The same whitish points and presumably miliary tubercles were also observed scattered over the peritoneum.

The patient suffered very little from shock, and the temperature never rose beyond 100.2°. The gauze drainage proved most serviceable, the amount of fluid removed from the abdomen through its means being enormous. The inner packing was removed on the fifth day and the remainder two days later. A large granulating cavity was left, which had nearly closed at the time the patient left the hospital four weeks later.

An examination of the patient made in April, 1893, shows her general condition to be excellent. She has gained twenty pounds in weight and shows no signs of any tubercular trouble. A small sinus, however, into which a probe may be passed two inches, remains at the lower border of the abdominal incision.

In this case a probable diagnosis of tubercular disease was made prior to the operation, because of the occurrence of two cases of tuberculosis within a comparatively short time, and because of the presence of the ischio-rectal abscess. Like the majority of cases where the appendages are tubercular and no deposits can be made out in the lungs, pleura, or peritoneum, a positive diagnosis was impossible until after the section. It is just in these cases that the frequency of tubercular disease should be borne in mind, and a laparatomy with removal of the appendages should be made rather than trust to the more pal-

liative treatment of aspiration and drainage through the vagina. Had the latter course been pursued in this case the tubercular disease would not have been removed, and the danger of an extension of the process would have been great. This, therefore, is another and strong argument in favor of radical surgical procedure, whenever possible, in a certain class of cases of chronic disease of the appendages. Even if the tuberculosis does not exist, unless the diseased organs are removed, they may present the one weak point favorable to the subsequent deposit and growth of the tubercle bacilli. In speaking of tubercular disease of the Fallopian tubes Osler says: "The process is commonly confined to the distal ends, and may be primary—which is usual—or is secondary to the peritoneal involvement. Gynecologists now diagnose and remove dilated tubes with such facility that we have numerous opportunities of studying primary tuberculosis of these organs. I have frequently been impressed with the wisdom of this procedure as a protective measure, on seeing large caseous tubes with miliary nodules on the peritoneal surface, since the danger of general extension in such cases is great."

In the writer's opinion, the use of the glass drainage tube in this case would have been followed by a fatal result. Peritonitis would have resulted with almost a certainty, had not the intestinal surfaces been prevented by the gauze from coming in contact with the caseous masses which it was impossible to remove.

Case IV. *Tuberculosis of Right Tube and Ovary; Caseous Degeneration of Latter; Fistula opening into Rectum; Removal of Appendages; Recovery with resulting Fecal Fistula.*—Mrs. H., age 24, married three years, no children or miscarriages, was referred by Dr. J. A. De Vore. A marked tubercular history existed on the mother's side. Had enjoyed fairly good health until 14 years of age, when she had an attack of "inflammation of the bowels," from which she did not recover for two years. Menstruation has never been regular, sometimes no show appearing for months at a time. Five years ago chronic diarrhea with severe pelvic pain set in, and she was supposed to have consumption and given up to die; but after two years of suffering she began to mend, and had fairly good health until February, 1891, when she caught cold at the menstrual period and had an attack of pelvic inflammation which

confined her to the bed for six or eight months. An abscess developed, which ruptured into the rectum and has never healed. For the past year she has steadily been losing flesh and strength.

An examination before entrance showed patient greatly emaciated. The left iliac region contained a hard tumor the size of a large orange. Another smaller mass was located in the right side. A vaginal examination showed the uterus immovably fixed in a mass of exudation filling up nearly the entire pelvis. No fluctuating point could be made out. Patient placed upon tonics and nutritious diet preparatory to a radical operation for removal of the appendages. The temperature fluctuated between 99° and 101°, and large quantities of pus were passed per rectum.

Examination, October 19th, showed a tumor in left iliac region, somewhat less sensitive and a trifle smaller because of large quantities of pus passed. At this time it extended upward in the abdomen as high as a line drawn from anterior superior spine of ilium to umbilicus, downward as far as Poupart's ligament, and inward as far as median line.

Laparatomy October 25th. Peritoneum much thickened. Entire pelvis filled with adherent intestines and omentum. Carefully separating these, a mass of caseous material was found under and apparently within the left broad ligament. This mass was the size of the fist and apparently made up of the ovary and surrounding tissues and the fimbriated extremity of the tube. The uterine end of the tube was the only portion which could be identified, so extensive was the degenerative process. Upon some of the distinguishable portions of the tube and adjacent peritoneum were situated small miliary tubercles. The mass, made up of tube and ovary, was shelled out of its bed, and the caseous material found to have invaded the broad ligament at its outer extremity. It was impossible to remove all this tissue, for in some portions it was intimately adherent to the intestines and could not be detached without peeling away the serous coat. In removing the right tube and ovary, which were buried in a mass of adhesions, and to which the intestines were firmly adherent, an abscess cavity was opened, from which a small quantity of pus escaped. A fistulous opening into the rectum, two inches below the sigmoid flexure, was discovered. The edges of this opening were denuded and brought together by five silk sutures. The abdomen was thor-

oughly irrigated with sterilized water and the pelvis packed with iodoform gauze after the method of Mikulicz, great care being used to protect the uncontaminated portions of the peritoneum.

The patient was placed in bed in good condition and suffered very little from shock. The inner gauze was removed on the fourth day, and it was found that the edges of the fistula had failed to unite, as fecal matter appeared upon the dressings. The discharge was kept washed away with sterilized water and the outer gauze drain gradually removed. For a time it was doubtful whether the patient, owing to her exhausted condition, would survive, but by constant care she was carried along from day to day until reaction slowly set in.

The cavity left after the removal of the gauze, at the bottom of which was situated the opening into the intestine, filled in gradually with granulation tissue. There is now only an opening admitting the forefinger, and only occasional particles of fecal matter escape through the wound. The patient has gained thirty pounds, is entirely free from pain, and able to do light work. There is every prospect of the eventual closing of the fistula.

In this case there is a clear history of repeated attacks of pelvic peritonitis, a collection of pus within the pelvis, its rupture into the rectum, and the discharge kept up by imperfect drainage of the abscess cavity. The deposit of tubercle bacilli in the diseased appendage followed, and tubercular peritonitis or general tuberculosis would have followed but for timely operative interference. It would lead one to question whether the deaths which result from long-standing cases may not in some instances be due to the establishment of tubercular disease, and the causes wrongly ascribed to exhaustion from long-continued suppuration. In view of these facts complete eradication of the diseased structures in this class of cases becomes imperative and palliative treatment should be condemned.

The iodoform-gauze drain in this, as in Case 3, undoubtedly was the means of preventing a general peritonitis. Had the patient escaped sepsis arising from the caseous material which was left behind, peritonitis would almost to a certainty have followed from the escape of fecal matter into the general peritoneal cavity, had not the latter been protected by the gauze.

THE GILBERT.

THE QUESTION OF OPERATION IN CASES OF CHRONIC OVARITIS.[1]

BY

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As a consequence of the absence of knowledge concerning the pathology of the diseases of the uterine appendages, Battey and his immediate followers, including Sims, removed the uterine appendages whenever symptoms referable to those organs rendered the life of a patient miserable or unbearable, if the symptoms proved rebellious to less heroic treatment. Such an indication proved very elastic in the hands of some men, and was the excuse for the removal of a certain number of ovaries without sufficient cause. I say a certain number, because I have never been convinced that the number was a large one. As a result of the increase in knowledge concerning the pathology of the diseases of the uterine appendages, it became known that usually when women suffer marked pelvic symptoms, and are made invalids thereby, these symptoms are due to gross disease in the Fallopian tubes or in the ovaries. Thus grew out of the operative work done for symptoms alone the present much more satisfactory and scientific plan of operating for demonstrable disease. The demonstration that what had been regarded as chronic cellulitis was in reality diseased and adherent tubes and ovaries, so stimulated the study of the diagnosis of pelvic disease that the subject was revolutionized. Instead of feeling that he has accomplished a feat when he has discovered the size, shape, and position of the cervix and uterus, the practitioner feels that the examination is only begun and that the same information must be obtained concerning the uterine appendages and the perirectal regions. The fact that it is possible, in the majority of cases, to thoroughly explore the pelvis, and the further fact that marked symptoms of pelvic disease are usually dependent upon gross changes in the uterine appendages, led to the formulation of the rule of practice that the abdomen should not be opened for the removal of the tubes and ovaries

[1] Read before the eighteenth annual meeting of the American Gynecological Society.

unless gross disease in those organs could be made out by the bimanual examination. The basis of this rule, I believe, is partly good and partly bad. In so far as it restrains reckless or unnecessary operating, it is a rule looking in the right direction. But when carried to its logical conclusion it is far too sweeping in its character. Those who have laid special stress upon this rule of practice should take care lest the fact that it is too sweeping in its character shall lay them open to the charge of seeking that variety of popularity which ever attaches to the man who advocates what is, *at the time*, called conservative, whether it be wrong or right. That there are cases of inflammation of the ovaries and Fallopian tubes of a chronic character, in which, upon bimanual examination, the only evidence of the condition is slight enlargement or thickening of the organ, or in other cases a diminution in its size, and in others an entire absence of change recognizable by examination, and yet which demand the ablation of the organs to effect a cure, it will be the purpose of this paper to show. Such cases are far from common, but often are the greatest of sufferers, and this fact requires that, unless some method of cure be discovered in the future, these poor women shall not therefore be condemned to lifelong invalidism.

The intractable nature and painful character of chronic ovaritis are universally recognized. Thomas ("Diseases of Women") states that "we know of but few curable disorders which we dread to meet so much as this. The day will probably come when our treatment for it will be satisfactory and efficient, but it has not yet been so by any means. Many cases will baffle treatment, and all will prove but little amenable to it." Winckel ("Diseases of Women") says: "The disease is curable, but complete restoration probably never occurs." Also, "The prognosis is not favorable, however, even in such cases (referring to cases in which the inflammation has subsided), because cohabitation is painful, conception impossible, and sexual excitement often causes recurrence of the disease." Skene ("Diseases of Women") says: "If the patient has the good fortune to be placed early under treatment, the chances for recovery are favorable." Also, "I have never seen a fatal case, but I have seen several in which life was not worth living." Further (referring to cases in which treatment has failed to give relief): "If the patient suffers so much that her life is useless, the ovary, or

ovaries, should be removed. In case that only one ovary is diseased, and the other is normal, the affected one only should be removed. So far as I can learn, there is less likelihood of erring in removing both." Martin ("Diseases of Women") says: "The prognosis in chronic oöphoritis is not very favorable, as far as concerns complete recovery, but it is better if the question is one as to recovery from the suffering, with a probability of sterility and premature cessation of menstruation. Also, "In other cases the suffering increases to such an extent that every mode of treatment fails." In other words, the testimony is unanimous that chronic ovaritis not infrequently resists all efforts at cure and renders the life of the patient thoroughly miserable and not worth living. At the same time it is fully recognized that when patients are seen early in the course of the disease, when perhaps "hyperemia" would be a better term than inflammation by which to designate the condition, it is curable. Under exceptionally favorable circumstances, in women of vigorous general health and in good financial circumstances, able to command the means necessary to lead an indolent life for several years and to secure efficient professional attention, the disease is curable even if more advanced; but there remain many cases which absolutely resist every effort at cure. The intractable cases are more commonly those of women of poor physical development, especially if the development of the sexual organs themselves has been arrested before reaching maturity. Also, in my own hands, some of the most rebellious cases have been in women inclined to corpulence.

The question as to what shall be done with this class of women suffering from chronic ovaritis which has resisted all attempts at cure, is most important. The experience of each one of us teaches that we have no greater sufferers under our care. Shall we permit these poor women to drag out a miserable existence, suffering with pelvic pain, menstrual distress, numerous reflex neuroses, disordered digestion and nutrition, and aggravated neurasthenia, or shall we restore them to comparative, if not absolute, health by the radical operation of removing the affected ovary or ovaries? From my standpoint the answer is clear. Whenever chronic ovaritis resists well-directed treatment, continued over one or more years, and the life of the patient is made unbearable by reason of the disease, it is not only justifiable but urgent to remove the offending organs.

I am perfectly aware that in making this statement in unmistakable terms I shall call down upon myself the condemnation of those who arrogate to themselves the quality of conservatism, but this, I believe, is a small matter. True conservatism, in my opinion, does not consist in saving a hopelessly diseased ovary at the expense of the health and happiness of its possessor, but in restoring such a woman to reasonable health at the expense of her ovary. "If thine eye offend thee, pluck it out."

It is unfortunately true that the operation of removing the uterine appendages for the disease under consideration is liable to abuse, but this fact must not interfere with its performance under legitimate conditions. It behooves us all to use our influence against the rash and ill-advised removal of ovaries, and equally to use our influence in favor of such a method of treatment whenever circumstances demand it. The common sense of the profession and of the public, I feel sure, will justify the operation when done after the failure of less radical measures of treatment. The picture is, upon one side, a most miserable and hopeless sufferer; and upon the other, a woman restored to comparative health.

That my own course has been anything but a radical one is shown by the fact that, including all cases which can possibly be grouped under this head, I have performed but fifteen operations for the removal of ovaries the seat of chronic inflammation, upon thirteen women. Of the fifteen operations eight were unilateral. However, this includes two in which the operation was repeated upon the other side, the first operation having failed to cure. Four of the operations could more properly be designated as operations for arrested development of the sexual organs. In each of the four cases the ovaries were the seat of chronic inflammation. There were seven women from whom both uterine appendages have been removed for chronic ovaritis (this includes the four operations for arrested development). The number must be increased to nine, however, because in one case of cystic ovaries, chronic ovaritis and salpingitis, and metrorrhagia, the second appendage was removed nine months after the first because of the complete failure of the first operation to relieve the symptoms. At the time of the first operation one appendage did not seem to be *seriously* diseased—although not *perfectly* healthy—but when removed nine months later it was in the same condition as the one first removed. Also, in

Case 5, 14 of the table a second operation and removal of the remaining appendage became necessary. When it is considered that during the time under consideration one hundred and seventy-four celiotomies have been performed, the fact that I have been very careful in recommending operation in this class of cases is sufficiently apparent.

Unless some new method of treatment shall be discovered which will cure those cases of chronic ovaritis which at present resist non-operative treatment, the ablation of these organs will continue to be practised in such cases, if it can be shown that thereby these women can be restored to health. The results in my own hands have been very satisfactory. Without exception every woman was cured or greatly benefited in the cases in which both ovaries were removed. In two cases in which but one ovary was removed this was not the case. In the first, that of Miss W., operated on May 28th, 1891, in which, in addition to chronic inflammation of the ovary and of the tube, the ovary was studded with greatly enlarged follicles, the first operation failed utterly to give relief. Miss W., age 21 years, consulted me March 12th, 1891, complaining of marked debility and of metrorrhagia—periods coming every three weeks, lasting seven days, with copious flooding. This had been present for a year. During the year, in spite of careful treatment on the part of her family physician, a most intelligent practitioner, she had been getting steadily worse—lost thirty-eight pounds during the time, and this in spite of a good appetite. She is extremely neurasthenic, anemic, and suffers constantly with pain in the left groin, which is aggravated by exertion. A line of treatment was advised, which was followed by her physician without improvement. Curetting was done later, but it failed to arrest the hemorrhages. Accordingly an abdominal section was advised and the left uterine appendage was removed. This operation relieved her pain upon the left side, but otherwise it had no effect. Subsequently she was treated faithfully and systematically by rest, local treatment, including galvanism, and general tonic medication, without avail. She became clamorous for the removal of the remaining ovary, to which operation I felt opposed, as at the first operation it did not appear much diseased. As her condition continued to grow worse, consultation with Dr. Howard A. Kelly was requested, and he and the family physician, Dr. G. G. Faught, agreed upon the necessity for an early

operation, rather against my protest. Promptly after the second operation she began to improve, feeling, as she expresses it, "like another girl," and she is now in perfect health. In the second case, that of Mrs. H., widow, age 34 years, mother of three children, the unilateral operation likewise failed. She consulted me March 6th, 1891, being referred by Dr. Morris Booth Miller, with the following history: She had been an invalid since the birth of her last child ten years previously. She complained especially of debility, and constant and aggravated backache and pain in the left groin, obstinate constipation and headache. She was anemic and had chronic bronchitis and laryngitis. Two of her three children had died of tuberculosis. She had just been discharged from a hospital in a neighboring city, where she was under treatment for peritonitis. Examination showed a torn perineum, the womb enlarged, retroflexed, and the left ovary enlarged, prolapsed, and very sensitive. April 2d, 1891, the left ovary and tube were removed, and the womb brought forward by including the round ligament in the ligature. Subsequently the perineum was restored. After a time she improved very much and entered a training school for nurses. The womb eventually again became retroflexed. Her general health broke down and the old symptoms, especially that of obstinate constipation, returned. The remaining ovary was very tender and menstruation extremely painful. She would hardly recover from the prostration due to one period before the next arrived. Chronic laryngeal trouble reappeared and I feared the development of phthisis. On this account I advised the removal of the remaining ovary to put a stop to menstruation, which was done on January 9th, 1893. At the same time the uterus was fastened to the abdominal wall. While still in bed the constipation disappeared, plainly showing that *it* had been due to the retroflexion. Mrs. H. has steadily improved and expects shortly to resume her work as a nurse.

The results in the remaining cases of unilateral removal of the uterine appendages are as follows: Cases Nos. 2 and 9 of the table are in perfect health. Case No. 2 was last seen two years after her operation. Case No. 9 is pregnant at the present time. Cases Nos. 11 and 12 have not done so well, but their present condition is markedly better than it was before the operation. Each was extremely neurasthenic, and neither has entirely recovered control over her nervous system. In each

case, however, instead of being invalids, the improvement has been sufficient to enable them to attend to their duties.

The results in the cases of bilateral removal of the uterine appendages which have not been referred to already have been excellent. In Case No. 1, however, the result has not been quite so good as in the others. Case No. 1, the mother of several children, suffered so much that she was absolutely unable to attend to her domestic affairs. Her husband had deserted her on this account, and she and her children were a charge upon her friends. In addition to chronic ovaritis she had a variocele of the broad ligament and a torn perineum. The perineum was restored and the uterine appendages were removed, the ligature being deeply placed so as to include many of the distended veins. As a result of her operation she became able to attend to her domestic duties and is now living with her husband. Although somewhat neurasthenic, she was (a few months ago when last heard from) a comparatively healthy woman.

In the four cases of arrested development of the sexual organs with chronic ovaritis the results have been very good. The present condition of each of them is very satisfactory. One is now a successful trained nurse, another is a saleswoman in a store, the third a dressmaker, and the fourth a domestic servant. As a result of the fifteen operations we have to report no deaths, and the comparative or absolute restoration to health of thirteen women who were as great sufferers as any with whom it has been my lot to meet, and who, without operation, could look forward only to a life of continued and aggravated suffering.

The text books (even some of the recent ones, as, for instance, J. Bland Sutton, "Surgical Diseases of the Ovaries and Fallopian Tubes") state that the mortality of oöphorectomy is greater than that of ovariotomy. Why this should be so I fail to see, nor do I believe that it is true. If the ligatures have been properly tied, and if the operation has been performed aseptically, every case should recover. A death following so simple an operation would imply gross carelessness upon the part of the surgeon, unless something out of the ordinary should be present in the individual case—as, for instance, heart, lung, or kidney disease.

As I look at the subject, in order to secure good results from operations for chronic ovaritis it is essential that the diagnosis

No.	Name and Date.	Age.	M., S., W.	Par.	Disease.	Condition.	Operation.	Time (In minutes).	Drain.	Course.	Temp.	Union.	Hospital.	Result.
1	Mrs. M., Oct. 14, 1889.	26	M.	1	Chronic ovaritis; varicocele of broad ligament.	Poor.....	Abdominal section; removal of uterine appendages.	25	None.	Uninterrupted.	A.[1]	P.[2]	H.[3]	R.[4]
2	Mrs. P., May 3, 1890.	22	M.	0	Chronic ovaritis; right ovary.	Poor.....	Abdominal section; removal of right uterine appendage.	20	48 hours.	Slight peritonitis on the second day.	F.	P.	H.	R.
3	Miss C., Oct. 23, 1890.	23	S.	0	Chronic ovaritis; dysmenorrhea; arrested development of sexual organs.	Neurasthenic.	Abdominal section; removal of uterine appendages.	25	48 hours.	Uninterrupted.	A.	P.	H.	R.
4	Miss S., Mar. 23, 1891.	34	S.	0	Chronic ovaritis; rudimentary appendages.	Neurasthenic.	Abdominal section; removal of uterine appendages.	30	48 hours.	Uninterrupted.	A.	P.	H.	R.
5	Mrs. H., Apr. 2, 1891.	34	M.	3	Chronic ovaritis; retroflexion.	Very poor.	Abdominal section; removal of left uterine appendage.	30	24 hours.	Slight bronchitis.	A.	P.	H.	R.
6	Miss W., May 28, 1891	21	S.	0	Chronic ovaritis; cystic degeneration; catarrhal salpingitis; metrorrhagia.	Fair.....	Abdominal section; removal of left uterine appendage.	35	48 hours.	Uninterrupted.	A.	P.	H.	R.
7	Miss R., July 30, 1891	30	S.	0	Chronic ovaritis; rudimentary appendages.	Neurasthenic and anemic.	Abdominal section; removal of uterine appendages.	30	48 hours.	Uninterrupted.	A.	P.	H.	R.
8	Mrs. S., Sept. 4, 1891.	27	M.	2	Chronic ovaritis, left ovary.	Anemic...	Abdominal section; removal of left uterine appendage.	35	48 hours.	Stitch-hole abscess.	A.	P.	H.	R.
9	Miss M., Sept. 28, 1891	25	S.	0	Chronic ovaritis; poorly developed appendages.	Poor.....	Abdominal section; removal of uterine appendages.	35	48 hours.	Uninterrupted.	A.	P.	H.	R.
10	Miss W., Feb. 4 1892.	22	S.	0	Chronic ovaritis; cystic degeneration; salpingitis; metrorrhagia.	Fair.....	Abdominal section; removal of right uterine appendage.	25	None.	Uninterrupted.	A.	P.	H.	R.
11	Miss T., May 26, 1892.	29	S.	0	Chronic ovaritis, left ovary.	Anemic...	Abdominal section; removal of left uterine appendage.	25	48 hours.	Uninterrupted.	A.	P.	H.	R.
12	Mrs. D., Nov. 3, 1892.	28	M.	2	Chronic ovaritis, left ovary.	Worn	Abdominal section; removal of left uterine appendage.	35	None.	Uninterrupted.	A.	P.	H.	R.
13	Mrs. G., Nov. 10, 1892.	45	M.	2	Chronic ovaritis.	Worn. ..	Abdominal section; removal of uterine appendages.	30	None.	Uninterrupted.	A.	P.	H.	R.
14	Mrs. H., Jan. 9, 1893.	35	M.	3	Chronic ovaritis; retroflexion.	Very bad..	Abdominal section; removal of right uterine appendage; hysterorrhaphy.	30	None.	Uninterrupted.	A.	P.	H.	R.
15	Mrs. W., Mar. 8, 1893.	23	M.	2	Chronic ovaritis; cystic degeneration; metrorrhagia.	Very anemic.	Abdominal section; removal of uterine appendages.	25	None.	Uninterrupted.	A.	P.	H.	R.

be correct. If normal ovaries are removed for hysterical symptoms, failure, of course, is to be expected. In the second place, strict asepsis is essential to prevent the formation of intraperitoneal adhesions or infection and inflammation of the stumps. Either of these accidents will postpone, and may prevent, a cure. In no class of cases, moreover, is it more essential that the surgeon should be a capable practitioner than in this. All these women have broken-down nervous systems with disordered digestion and nutrition. These conditions must be treated and cured in order to cure the patient. It is well recognized that not only careful medication, but judicious hygienic regulations, and the "mind cure" which results from a personal control of the wise physician over his patient, are necessary to achieve good results under these conditions.

The carping critic will inquire, Why were not these conditions cured before resorting to operation? The answer is that during the existence of the ovarian disease this is impossible. The ovarian disease must be removed either by medical or surgical means before the resultant conditions can be cured. It is the old story of treating inflammation in a wound without removing the foreign body.

In conclusion I wish to say that while no one is more strongly opposed to the hasty removal of ovaries diseased by chronic inflammation than I am, yet I hope to see the recognition of the propriety of removing these organs, when so diseased, admitted by all, if careful, systematic, and judicious treatment has been persisted in for a period of one or more years without effecting a cure, and if as a result of the condition the health and happiness of the patient are wrecked. The greater the poverty of the patient, and the greater the duties which she is called upon to perform, the sooner, in my judgment, is radical treatment called for. As a matter of prudence it would be well in all such cases to have the opinion of another competent gynecologist before resorting to operation. All ovaries removed because of chronic ovaritis should be submitted to a competent pathologist for careful study, that new light may be thrown upon these conditions.

Opposite is a table of the fifteen operations, which has been prepared by Dr. H. E. Applebach, Assistant Surgeon of the Kensington Hospital for Women.

2134 HANCOCK STREET.

THE OPERATIVE TREATMENT OF COMPLETE PROLAPSUS UTERI ET VAGINÆ.[1]

BY

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ONE purpose of this communication is to call renewed attention to, and to emphasize, the fact that prolapsus of the uterus, even in its severest forms, is readily, speedily, and permanently curable by modern gynecic surgery.

My second object is to elicit, in the discussion to follow, your individual experiences and methods in the operative treatment of complete prolapse of the uterus and vagina. For although we may all agree that prolapsus is curable by operation, yet will we probably differ considerably both in the kind and in the technique of the operations we employ.

Personally I am not wedded to any routine line of operative treatment, but am inclined to be eclectic, and try to differentiate the indications as presented in individual cases as far as I am able. And this notwithstanding a satisfactory degree of success in the employment of ventrofixation of the uterus combined with the various plastic operations called for by the condition of the uterus, vagina, and pelvic floor, all required operations being performed at one sitting.

I have limited myself in this paper to *complete* prolapsus of the uterus and vagina—*i.e.*, to the consideration of those cases only in which the entire uterus and vagina are outside of the vulva. It will readily be granted that, provided we can deal successfully with these extreme cases, the lesser degrees of prolapsus should offer no special difficulties.

The first question that arises in connection with the operative treatment of complete prolapsus of the uterus is one of principle: Shall we endeavor to preserve the uterus, or shall we remove the prolapsed organ by total extirpation? Until such time as it

[1] Read before the annual meeting of the American Gynecological Society, 1893.

can be shown that the results achieved by total extirpation of the uterus for prolapsus are better and more lasting, as well as that the operation is no more dangerous than the rival procedure, I shall adhere to ventrofixation of the uterus combined with the necessary plastic operations as the rule, practising total extirpation only on exceptional indications.

Such exceptional indications, to my mind, are:

1. A uterus so large and heavy that it cannot be reduced to an approximately normal size and weight by amputation of the cervix.

2. A uterus presenting either positive evidence or strong suspicion of malignant disease.

3. A uterus with appendages so diseased that the condition of ovaries and tubes calls for their removal, apart from other considerations.

It must be remembered, also, that total extirpation of the uterus is in itself not sufficient to cure complete prolapsus of the uterus and vagina, but that plastic operations, of one kind or another, upon the vagina and the pelvic floor are required in addition.

The only method of total extirpation for prolapsus claiming to dispense with the necessity, in some cases at least, of these added plastic procedures, is that advocated and practised by Dr. W. M. Polk. Dr. Polk opens the abdomen, removes the uterus from above, and attaches the cut end of the vagina to the abdominal wall in closing the wound of the latter. The ingenuity, originality, and plausibility of the procedure recommend it strongly, even without the crucial test of its successful use by such a reliable observer as Polk. Although I have no reason to be dissatisfied with my experience, limited though it be, in the combination of vaginal hysterectomy with operations upon vagina and perineum, I shall, in the next case of total prolapse calling, in my opinion, for total extirpation of the uterus, give the method of Polk a trial.

My objections, then, to the routine practice of total extirpation of the uterus for prolapsus of that organ and the vagina are based on two grounds mainly. Firstly, because the practice is opposed to that rule of conservative surgery which calls for the preservation of all organs which by their presence menace neither life nor health. Secondly, because total extirpation neither lessens the danger nor simplifies the operative technique, except, perhaps, when practised after the method of Polk.

On the other hand, with healthy tubes and ovaries, ventrofixation of the uterus, combined with plastic operations, preserves the possibility of child-bearing, and for that reason alone is entitled to favorable consideration in quite a large number of women.

Leaving out of consideration now those exceptional instances in which total extirpation is called for in the treatment of complete prolapsus of the uterus and vagina, I would strongly insist, in all cases of complete prolapsus, in the operative treatment of which the uterus is preserved, upon ventrofixation of the uterus as an essential adjunct to whatever plastic operations upon the uterus, vagina, and perineum may seem called for.

A properly performed ventrofixation of the uterus gives a better guarantee of permanent cure of the prolapsus than any one of the additional plastic operations singly, or perhaps than any given combination of these additional operations looking to the preservation of a vagina, can give. And this preservation of a vagina is a very important matter to nearly every one of our patients.

Consequently I would lay it down as an axiom that whenever the uterus is preserved in prolapsus operations it should be *securely* ventrofixated. I say securely advisedly, because in the only one of my cases of uncomplicated complete prolapsus in which I did ventrofixation, and in which I have known a recurrence of the prolapse to take place (Case 4), I have reason to believe that the uterus was not properly ventrofixated, the transperitoneal hysterorrhaphy of Krug having been performed. By this I do not mean to assert that the failure was due to the method of operation. The fault may have been with the operator, whose first as well as last experience with the method it constituted.

I confess to a considerable degree of scepticism regarding the ability to obtain a permanent cure of *complete* prolapsus of the uterus and vagina by the various methods of vaginal fixation of the uterus after Schücking, Dührssen, Mackenrodt, and others, although a number of operators seem to be satisfied with their results thus obtained.

Whatever plastic operations, joined with ventrofixation of the uterus, are indicated by the conditions presented in a given case of prolapsus of the uterus and vagina, I cannot too strongly insist upon the performance of all of them, including the ven-

trofixation, at one sitting. Not only is our patient at this day entitled to expect this from the expert and to claim only one anesthesia, but the result must be better when all operations are performed at one sitting, each separate operation forming one stone of the arch, the integrity of which is endangered by even the temporary absence of one such stone.

The various combinations of operations I have practised in each of my twelve cases, comprising my entire experience, exclusive of two cases already published, with the operative treatment of *complete* prolapsus uteri, will be found recorded in the table appended. The two cases already reported were complete failures. In one[1] the prolapsus was due to a tubercular ascites. In the other[2] ventrofixation of the uterus was not performed.

As I have, in the second of the papers just alluded to, fully described my technique in the performance of the various operations entering into combination in the treatment of complete prolapsus uteri, I will not enter anew upon the subject here.

I will merely reiterate that I have abandoned shortening of the round ligaments as a prolapsus operation, for the reason that, although a good and permanent result was obtained in Case 1 of the appended table, it has signally failed to realize expectations in a number of cases of incomplete prolapsus in which I have employed it in conjunction with plastic operations.

A phenomenon of quite frequent occurrence, in cases otherwise showing perfect results, has been the recurrence of a slight cystocele, not annoying to the patient, but still indicating to the operator a desideratum in the shape of improved technique with a view to its prevention.

In the three cases in which lateral colporrhaphy was performed instead of an anterior and a posterior colporrhaphy, no cystocele was subsequently noted. The writer believes that this result is not merely dependent upon chance, but is associated with the fact that in performing lateral colporrhaphy we secure a hold upon the fixed lateral walls of the pelvis, whereas in anterior and posterior colporrhaphy we attach the vagina to

[1] "Tubal and Peritoneal Tuberculosis," Transactions of the American Gynecological Society, 1891.

[2] "Combined Gynecological Operations," American Journal of the Medical Sciences, September, 1892.

No.	Name.	Age.	State.	Children.	Condition before operation.	Date of operation.	Operations performed.	Result.
1	K. W.	43	Married.	2	Tubes and ovaries normal. Complete prolapsus of uterus and vagina. Laceration and great hypertrophy of cervix.	February 19th, 1890.	Amputation of cervix. Shortening of round ligaments. Perineorrhaphy.	April 19th, 1893: Uterus at normal height in pelvis and in normal anteversion. Vagina and perineum normal. Slight cystocele. Has been doing the hardest of housework, and considers herself perfectly well.
2	M. P.	44	Married.	8	Ovaries and tubes normal. Complete prolapsus of uterus and vagina. Laceration and enormous hypertrophy of cervix. Uterine cavity 11.5 centimetres deep.	March 5th, 1890.	Amputation of cervix. Shortening of round ligaments. Perineorrhaphy.	Result perfect six weeks after operation. No trace of patient since.
3	K. S.	54	Widow.	4	Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Uterine cavity 13 centimetres deep. Cervix deeply lacerated and enormously hypertrophied. Extensive ulcerations of vagina.	June 2d, 1890.	Amputation of cervix. Anterior colporrhaphy. Colpo-perineorrhaphy.	Result good on discharge, a month after operation, since when patient has not been seen or heard from.
4	L. M.	35	Married.	2	Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Uterine cavity 9.5 centimetres deep. Cervix lacerated and deeply excoriated.	December 3d, 1890.	Anterior colporrhaphy (purse-string operation). Hysterorrhaphy (transperitoneal method of Krug). Colpo-perineorrhaphy.	Complete failure, the prolapsus recurring in two months. Prolapsed uterus impregnated; abortus produced by family physician at third month. Second operation two years later (Case 10).
5	E. F.	33	Widow.	2	Extensive diastasis of recti abdominis. Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Cervix lacerated and moderately thickened.	April 1st, 1891.	Curettage of uterus. Amputation of cervix. Anterior colporrhaphy (purse-string operation). Ventrofixation of uterus. Perineorrhaphy.	Remains well, although doing the hard work of a restaurant cook. Uterus well up, firmly attached to anterior abdominal wall. Perineum and posterior vaginal wall normal. Slight cystocele. Last seen April 19th, 1893.

6	M. M.	35	Married.	2	Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Deep laceration and hypertrophy of cervix.	September 11th, 1891.	Amputation of cervix. Anterior colporrhaphy. Ventrofixation of uterus. Colpo-perineorrhaphy.	On discharge, a month later, uterus well up in pelvis, firmly attached to abdominal wall. Vagina and perineum normal. Patient lost sight of.
7	M. M.	36	Married.	5	Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Bilateral laceration and thickening of cervix.	March 11th, 1893.	Curettage of uterus. Amputation of cervix. Anterior colporrhaphy. Perineorrhaphy. Ventrofixation of uterus.	Miscarried at second month, in October, 1892. Seen April 17th, 1893. Uterus, vagina, and perineum remain as they were immediately after operation. Complete cure.
8	C. L.	51	Married.	6	Ovaries and tubes normal in size. Complete prolapsus uteri et vaginæ of twenty-seven years' standing. Unsuccessful operations, in competent hands, three years ago.	April 1st, 1892.	Curettage of uterus. Anterior colporrhaphy. Colpo-perineorrhaphy. Ventrofixation of uterus.	Perfect result, the patient remaining cured when last seen, more than a year after operation.
9	M. K.	28	Single . .	. .	Ovaries and tubes normal. Complete prolapsus uteri et vaginæ, the result of a severe strain at lifting three years ago. Uterus has never been replaced since.	May 6th, 1892.	Curettage of uterus. Amputation of cervix. Lateral colporrhaphy. Perineorrhaphy. Ventrofixation of uterus.	Patient remains absolutely cured, a year after operation, although having done the hardest of work ever since.
10	L. M.	37	Married.	2	Case 4, relapsed, the same conditions presenting as recorded in Case No. 4.	October 4th, 1892.	Curettage of uterus. Lateral colporrhaphy. Perineorrhaphy. Bilateral salpingo-oöphorectomy. Ventrofixation of uterus.	Perfect result, lasting to date, May 13th, 1893.
11	R. W.	45	Married.	10	Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Laceration of cervix.	December 20th, 1892.	Curettage of uterus. Amputation of cervix. Anterior colporrhaphy. Colpo-perineorrhaphy. Ventrofixation of uterus.	Perfect result, with exception of slight cystocele, when last seen, April 15th, 1893.
12	M. C.	61	Married.	1	Ovaries and tubes normal in size. Complete prolapsus of uterus and vagina. Complete inversion of cervix uteri.	January 27th, 1893.	Vaginal hysterectomy, both tubes and ovaries being removed with the uterus. Lateral colporrhaphy. Perineorrhaphy.	Perfect result, lasting to date, May, 1893.

movable organs, the bladder and rectum. Re-descent of the vagina, dragging with it the bladder and establishing a cystocele, is thus favored.

Another great advantage of lateral colporrhaphy lies in the mathematical precision with which we are enabled to give any desired size to the resultant vagina. By leaving, for instance, a longitudinal strip, three centimetres in width, in connection with the bladder, and another of equal size attached to the rectum, removing the entire lateral walls of the vagina between these strips and approximating the lateral margins of the strips by sutures, a vagina six centimetres in circumference and about two centimetres in diameter will be left.

All the operations recorded for each case of the accompanying table were invariably performed at one sitting. Primary union was obtained in every plastic operation, and in all the ventrofixations except two. In these a small mural abscess for a short time delayed complete recovery.

198 SECOND AVENUE.

VAGINAL ENTEROCELE IN PREGNANCY AND LABOR.[1]

BY

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A VAGINAL enterocele large enough to complicate pregnancy and obstruct labor is one of the rarest complications in obstetrics. By the most thorough search that it was possible for me to make in medical literature, I have been able to collect only twenty-seven cases. This very rarity, however, must enhance the interest in the subject to a body of specialists whose function it is to recognize and deal successfully with those infrequent complications with which the general practitioner cannot be expected to be familiar. From an analysis of the collected cases and a single personal experience I have endeavored to answer the questions in regard to etiology, diagnosis, prognosis, treatment, and possible complications of vaginal hernia in the child-bearing process, that would naturally occur to a physician charged with the management of such a case.

[1] Read before the American Gynecological Society, May 18th, 1893.

Etiology.—The cause of a vaginal enterocele is usually some violent, sudden physical shock, as a fall; powerful straining efforts, as in labor and in obstinate constipation; or a frequently repeated, long-continued succussion of the abdominal contents, as in an uncontrollable cough during pregnancy. The last-named cause is expressly reported in four cases. Individual instances have been accounted for as follows: pressure of an abdominal or pelvic tumor upon the intestines, forcing them down; hard work in an erect or stooping posture; relaxation of pelvic tissues; an unusually long mesentery (possibly an effect and not a cause); a fall during pregnancy; retroflexion and incarceration of the gravid womb, enormously elongating Douglas' pouch; jumping rope in the sixth month of gestation; precipitate labor in the erect posture; premature getting up after delivery; undue violence in the extraction of the child. In the minority of cases no cause at all is mentioned, and in one it is stated that none could be discovered. In the majority of cases the cause is avoidable if the pregnant and parturient woman is watchfully treated, and if she seeks and follows her physician's advice in regard to her conduct during gestation. But there is no foreseeing all the rash things an imprudent woman might do. Who, for example, would think of warning a patient against "jumping rope" during gestation? Many of the causes noted above could be obviated by proper management of obstetric cases. Attention might be particularly directed to the influence of retroflexion of the gravid womb upon Douglas' pouch as an additional reason for the early recognition and correction of the displacement. This cause was operative in two cases.

Diagnosis.—The recognition of a vaginal enterocele in pregnancy and labor should be easy to a careful, methodical examiner. There is a history that the tumor made its appearance suddenly; it pushes before it almost always the lateral or posterior vaginal wall, descending in Douglas' pouch or to the outer sides of the utero-sacral ligaments. I can find but two cases of anterior enterocele complicating the child-bearing process. If the enterocele is large the vagina may be almost obliterated, reduced to a small canal running directly behind the symphysis pubis to the cervix, which may be displaced far upward and forward against the anterior abdominal wall. The rectum may be so compressed that the bowels are almost obstructed. In my case there was

but one evacuation in three weeks. The bladder, too, is compressed, and there is marked dysuria, followed shortly by a severe cystitis from the decomposition of residual urine. There have been, very likely, sharp attacks of colic, with perhaps nausea and vomiting, and there is a constant disposition to bear down. The abdomen is distended and tender, and there may be fever. The tumor itself is soft and compressible. Grasped between the thumb in the vagina and a finger in the rectum, its walls can be made almost to touch. There is the characteristic doughy feel of an intestinal and omental mass; gurgling may be appreciated; possibly the portion of the tumor projecting from the vulva may be resonant, but this was not so in my case, and I find it noted in only a single instance; a very distinct impulse is communicated to the mass by coughing or any abdominal effort, and in the majority of cases the tumor could be easily returned to the abdominal cavity and the aperture through which it had descended could be plainly felt.

The introduction of the whole hand in the rectum was recommended and practised in one case to make sure of the diagnosis, but this is a dangerous procedure, and is besides not necessary. It has been suggested to resort to forced injections of water in the rectum, to tell if the intestinal mass is composed of small or large bowel. To this there can be no objection if the distinction is thought to be important. In rare cases there is unmistakable evidence of the condition, if, as in one instance, the sac ruptures and several feet of intestine protrude from the vulva, or if, as in another, the covering of the hernia is so thin that the coils of intestine can be plainly seen.

Distinctive as are the signs of vaginal enterocele, the record of errors in its diagnosis is quite remarkable, considering the small number of cases reported. It was once taken for protruding membranes, and the physician was about to puncture it when he recognized its true nature; again it was supposed to be an ovarian cyst, and a proposition was made to tap it through the vagina. It has been incised for an abscess and cut off for a uterine polyp; Levret once arrived at a patient's house just in time to prevent this same procedure. Other conditions with which it has been confused and from which it must be differentiated are cystocele, rectocele, inverted uterus, retro-uterine hematocele, cystic tumors of the pelvis, prolapse of the vagina

and uterus, vaginal cysts, abscesses in the pelvis, and distended and adherent Fallopian tubes.

Prognosis.—If the enterocele is not excessively large, if it is reducible and the woman's circumstances admit of abstention from all work during pregnancy and possibly confinement to bed for a long period, the prognosis is almost absolutely favorable. If, on the contrary, the hernia is irreducible, if the woman is compelled to be on her feet and perhaps to do hard manual labor during gestation, the tumor will probably increase in size to an alarming degree, and all the symptoms referred to in the section on diagnosis will be aggravated. If the advance of the presenting part in labor pushes the intestines down into the pelvis, distends the hernial sac to the utmost, and prevents the reduction of the hernia, the tension of the sac walls will threaten immediate rupture, and the compression of the intestines between the head and the pelvic wall, subsequent inflammation and even gangrene. No one could watch the course of such cases without the liveliest apprehension of a serious accident, and even of a fatal result. In my own case the hernia was irreducible in pregnancy, and the sac was so enormously distended during labor that I thought it scarcely possible to avoid a rupture, and I expected at least a sharp attack of peritonitis, if nothing worse, after delivery; but fortunately the integrity of the sac was preserved and there were no untoward symptoms in the puerperium. The fear of these complications, however, is by no means illusory. In Schütz's remarkable case a posterior enterocele ruptured spontaneously in the seventh month of pregnancy; about three feet of small intestine protruded from the vulva for some hours until they were returned to the abdomen after being well washed; the vagina was tamponed, but symptoms of obstruction and peritonitis developed, and the woman died on the third day. In Smellie's famous case, also, there was apparently a rupture of the hernial sac in pregnancy, but the patient recovered. A third case of rupture is reported by a Dr. Taylor, in England, in 1831. The enterocele developed a few days after labor while the patient was sitting on a chair. Some months later an aperture was noticed at its lower part, discharging a yellowish fluid and occasionally clots of blood. The opening closed spontaneously and the patient subsequently conceived. Besides these cases of rupture six others are reported in which sharp attacks of peritonitis developed—one during labor, the others afterward, all end-

ing in recovery. There is no instance on record, however, of gangrene of the bowel in an enterocele following labor, although this would seem to be a very likely event to any one who has observed the tremendous pressure exerted upon the intestines in an irreducible vaginal hernia during labor, and it is mentioned by almost every writer on the subject as a danger to be feared.

Treatment.—If the physician sees his patient during her pregnancy, his first care is to reduce the hernia and to prevent its return. The first is usually to be accomplished with ease by appropriate taxis, possibly favored by the knee-breast posture. It is worth remembering that Breisky reports a case in which the hernia was reduced by the routine administration of purgatives after all efforts at taxis had failed. Occasionally—I think my case is the only one reported—the sac contents are adherent to the hernial ring and reduction is impossible. The second object of the treatment in pregnancy, the prevention of the return of the intestines into the pouch, is more difficult of attainment. It has been accomplished, however, by the use of a ball-and-stem pessary with external support, by tampons and vaginal water bags, with rest in bed. The first-named implement was used successfully in a woman who for six years had had an enterocele hanging a third way down the thigh. As pregnancy advanced the pessary caused so much irritation that it became necessary to remove it, but the hernia did not return, even in labor. If the enterocele is irreducible and the tumor attains considerable size as pregnancy advances, associated symptoms in the abdomen, rectum, and bladder will claim the physician's attention. In my case the woman was kept in bed for a number of weeks till premature delivery took place. I had determined to keep her at rest for the three months that should have elapsed before the child's birth. It was necessary to give an ounce of castor oil and three compound cathartic pills at one dose to secure the first evacuation of the bowels after she came under my care, and the bladder was washed out several times a day on account of the cystitis. If the physician sees the patient for the first time in labor, he will very likely find the process brought to a standstill by the bulk of the tumor in the vagina. He will naturally attempt the reduction of the hernia, and his attempt will succeed with remarkable ease and rapidity in the majority of cases. Occasionally the reduction will be difficult. In such a case a maneuvre that was success-

ful in Young's patient might be borne in mind. The woman was placed in the knee-chest posture; the operator inserted his whole hand in the vagina, reduced the hernia, inserted his fingers in the cervix, pulled it well down in the pelvis, while pressure through the abdominal wall was exerted upon the head to secure its firm engagement in the pelvis. The woman was then put in the left lateral position and the child was born in twenty minutes.

If the hernia is irreducible the enterocele can be pulled to one side or pressed back toward the sacrum, while the child is extracted with forceps or by the feet. But if the enterocele is large there must be imminent danger of rupturing the sac or the intestines themselves. Although the woman under my charge was delivered two months prematurely, there was the utmost difficulty in extracting the child. The sac was distended almost to the bursting point, in spite of the fact that two assistants held it out of the way and exerted counter-pressure on its walls. Had the patient gone to term I should have delivered her by Cesarean section, for I was convinced, even before the difficulty experienced in delivering a small premature infant, that a full-sized child could never pass the obstruction without inflicting serious if not fatal damage upon the mother. With the abdomen open an attempt might have been made, also, to radically cure the hernia.

If the sac should rupture, the intestines should be cleaned, returned to the abdomen, and the wound sewed up, but drained. The attendant should hold himself in readiness to open the abdomen, however, on the first appearance of threatening symptoms of peritonitis or obstruction. Of four cases treated thus expectantly, one in a non-pregnant woman, three made a good recovery.

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248 SOUTH 17TH STREET.

HYSTERO-EPILEPSY.

A REPORT OF SEVEN CASES CURED BY SURGICAL TREATMENT.[1]

BY

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I HAVE been quite surprised to see, on looking over the subject of uterine and ovarian neuroses, how little seems to have been written on the reflex epileptoid symptoms produced by diseases of these organs, and also how few cases have been reported of cures by surgical operations. It is somewhat surprising, too, what little unanimity of opinion is found among the writers on this interesting subject. It is not my intention to enter into the pathology of hystero-epilepsy in this short paper. I only desire to put on record these seven cases which I have to report of well-defined hystero-epilepsy, all of which have been perfectly and permanently cured.

Graily Hewitt, in his excellent work on "Diseases of Wo-

[1] Read before the eighteenth annual meeting of the American Gynecological Society.

men," lays great stress on the idea of hystero-epilepsy being mainly due to a "reflex irritation having its seat within the uterus, and that the particular irritation most potent in producing the reflex disturbance is flexion of the uterus."

This flexion undoubtedly produces a gradual congestion of the body of the uterus, the blood being retained in the uterine tissues proper. This, Mr. Hewitt says, is caused by the compression of the organ at its centre by the flexion of the uterus. As a result we have acute congestion of the body of the organ, which very easily becomes aggravated by certain movements or diminished by others. Another point is the compression of the nervous filaments of the uterine tissue at the spot where the compression is greatest. I have quoted Mr. Hewitt because I find him about the only one who has written at length on the subject, and who so fully describes the cause of the hystero-epileptic attacks as produced by flexions of the uterus.

I myself, however, think that his views cover a little too broad a field; for of the large number of cases of flexion I have treated, surgically and otherwise, in the past fifteen years, I have seen but three cases of true hystero-epilepsy which were caused by the flexion of the uterus, two only of which were cured by overcoming the flexion. I do not think that true hystero-epilepsy is met with very frequently even in a large gynecological practice. I do not think I can recall more than a dozen or so cases in twenty years' experience.

Case I.—The first case to which I desire to call attention is that of Mrs. A., age 30, married four years, never pregnant. First appearance of menstruation at 17 years of age; never regular, coming anywhere from three to eight weeks. Flow scanty and clotted, lasting two days, and accompanied by the most excruciating pains. The pains seemed to become worse with every succeeding menstruation. At the age of 27, one year after marriage, she had her first convulsion, as she called it, following an unusually severe menstrual epoch. These recurred every month thereafter for several months, until she became so worn out, worried, and frightened at herself that she used to have the hystero-epileptic attacks two or three times a week. She had been treated by electricity locally, and had taken every known medicine to gain relief. The only relief she could get was to cut the attack short by inhaling nitrite of amyl, a glass pearl of which she always carried with her in case

of being attacked in a store or on the street—a thing which did sometimes happen.

On making an examination of her case I found she had an extreme anteflexion of the uterus, small os, long, cone-shaped cervix pointing outward in the direct axis of the vagina. Here was a case that was just the same almost as described by Hewitt. I advised an antero-posterior section (Sims' operation) with dilatation. The operation was done that same week. The canal was thoroughly straightened, efficient drainage being kept up by the introduction of a small-calibre self-retaining stem made of hard rubber. This stem not only held the uterus in a straighter position, but by inducing a more efficient drainage of the uterine cavity the congestion and hypertrophy of the uterus were gradually reduced. Her first menstruation after the operation was almost a painless one. She had no sign of an epileptic attack, and her health has continued excellent in every way. She often thinks now, after six years, that she is going to have one on almost every occasion, and still goes round with the nitrite pearl. The nearest she has come to an attack was about two years ago when a relative died suddenly at the dinner table of heart disease. This was sufficient shock to have started an attack, but it only produced a fainting spell which was over in a few moments.

Case II. is that of a young girl seen three years ago. Her mother brought her to me on the recommendation of Dr. E. V. Buck, their family physician, to see what could be done for the frequent attacks of "fits" which the patient was subject to. She was only 16 years old, and very frail and delicate in build and appearance. She was anemic to a degree, and her skin was alabaster-like in appearance. She had had convulsions almost daily of late, and sometimes five or six a day, lasting anywhere from ten minutes to an hour and a half. She would lose consciousness every time. I saw her in two or three attacks, and they were most violent. She had always been a delicate child and of a very nervous temperament. She was sent early to boarding school, and while there she had quite a severe fall while skating on roller skates. Her first menstruation came on two months after this fall, and was accompanied by the most severe pains and a bad "fit." This was repeated the following month, and again thereafter monthly for two years. Then these hystero-epileptic attacks came with more frequency and violence,

until it was a common occurrence to have five and six attacks in one day. I found, on examination, that this case was very similar to the one preceding it, the body of the uterus being more congested and heavier, if anything, and very sensitive to the touch. By crowding the fundus down toward the bladder the symptoms of an approaching spasm could readily be produced. She was subjected to the very same treatment as Case 1, and with equally good results. The patient had one slight attack of convulsions the day following the operation, and that was the only sign of a return. One year ago she was married, and five days ago she was in my office, looking hale, hearty, and well, and five and a half months *enceinte*, having enjoyed perfect health since the treatment of three years ago.

I come now to the series of cases which showed unmistakable hystero-epileptic symptoms directly attributable to a diseased condition of the tubes and ovaries. This class of cases is more interesting to me than that already detailed, because of its more frequent occurrence, and because I think these cases are much more liable to a successful termination of the treatment than the ones that are due to a flexion or malposition of the uterine body alone. I am aware that the surgical treatment of these cases, taken as a whole, has not always proved a perfect panacea for the cure of the disease, and yet I think that some of us, at least, have had sufficient success to warrant the performance of a celiotomy for the relief of the distressing symptoms which always accompany a case of true hystero-epilepsy. I am rather surprised to find how few cases I can find recorded as cured by the removal of the uterine appendages. Dr. Thomas had three cases; my father, Dr. J. Marion Sims, reported three at the meeting of the American Medical Association in 1880, and Dr. Pallen reported three at the same meeting. Other gentlemen have reported isolated cases, and last year Dr. Vander Veer,[1] of Albany, reported six cases, in which two were cured, two decidedly improved, and two were doubtful. These five cases I here report do not represent the sum total of all the subjects of hystero-epilepsy I have treated, but they are five cases of absolute cures, which have remained perfectly well from the time of operation until the present, and it is for the purpose of putting these cases on record that I have written this short and

[1] Transactions of the Medical Society of the State of New York, February, 1892.

incomplete paper on the subject of hystero-epilepsy. Each of the cases had been subjected to thorough treatment, both local and constitutional, for months and years before I ever saw them, without the slightest benefit being derived from the treatment. Then it was that they and their family and friends were ready, in their desperation, to submit to almost any surgical operation that promised even the slightest chance of relief from the sufferings that the patient had been so long a victim to.

Case I.—I first saw this case in 1881. She was 28 years of age, married, and had never borne any children. To look at her she was the picture of health. Menstruation regular, but for nine years each menstrual period was accompanied with severe spasms of a hystero-epileptic character. These attacks came, at times, two or three times in a day, and the patient would lose consciousness for fifteen or twenty minutes at a time. She was of an extremely nervous temperament, as were also her father and mother before her. Her first two years of menstrual life were very irregular, coming in three, five, or eight weeks, and lasting only a day or two. I noticed that the labia were very markedly hypertrophied, and I asked her if she had ever been guilty of masturbation, and she frankly admitted she had when a school girl and had not the sense to know it was wrong. On examination I found the uterus very little enlarged, in good position, and not particularly sensitive. The ovaries and tubes were both enlarged—the former quite cystic and firmly adherent. Celiotomy was performed, adhesions broken up with difficulty, and both removed. The tubes were well-marked samples of advanced salpingitis, and the ovaries were cystic and about four times their normal size. The patient made a good recovery and had but one slight attack after the operation. I saw her two years after the operation, and again seven years after, and she still was in good health and free from any return of her trouble.

Case II.—In 1882 I read a paper before the American Society for the Prevention of Insanity and the Protection of the Insane, in the city of Philadelphia, in which paper I claimed that a certain per cent of insane women could be cured if more attention were paid to the condition of the uterus and its appendages in certain forms of insanity. Extracts from this paper were printed in the daily papers in various parts of the country. This was read by a gentleman from Troy, N. Y., who called on me and related the case of his sister, who was then an inmate of an

insane asylum in the western part of the State. The result of our conference was that he brought his sister to New York for me to see. I found her a stout, healthy-looking woman, 26 years of age, and unmarried. Very nervous disposition. Began to menstruate at 13 years of age, and always had been irregular. She had profuse leucorrhea and epileptoid attacks with each menstruation; severe pain in left iliac region, with nausea, preceded each menstrual period by two days. Hypodermic doses of morphia had to be administered for two days at every recurrence of menstruation. As she grew older these hystero-epileptic convulsions became more and more marked and severe, and of almost daily occurrence. She would lie in a state of unconsciousness for an hour at a time, and then scream and kick, and use the most abusive language to those about her. Then she would relapse into a condition of extreme melancholia with suicidal tendency. The family then deemed it best to place her in an asylum, and it was in this condition that I first saw her. I found the uterus somewhat enlarged and tender, and the left ovary about the size of a lemon, cystic and adherent, and lying directly behind the uterus in Douglas' cul-de-sac. I thought I saw here quite sufficient cause for her epileptic attacks and melancholia, and advised a laparatomy. After two or three days of preparation the operation was done. The left tube and ovary were found diseased and adherent, as previously diagnosed, and removed. This patient made a slow but good recovery. The right ovary and tube were perfectly healthy, and therefore were not disturbed. She had two or three mild convulsions at the return of menstruation, but after that improved rapidly. She is now perfectly well and a useful member of society.

Case III.—The third case, that of Mrs. K., was a most distressing one. Up to the age of 18 she was a healthy, strong girl and never had been ill in her life. At that age she was married, went away on her wedding tour, to return in a week in a most wretched and changed condition. She had vaginismus, and had tried in every way to patiently stand the torture of intercourse, thinking that every woman had to endure it for a time. At the end of a few days she was such a nervous, physical wreck of her former self that her husband was only too glad to conform to her request to be brought back home. I was sent for at once, recognized her condition, and operated on her for the vaginismus by excising the hymen. All went well

for a few months, when she became pregnant. About the sixth month of pregnancy I was hurriedly sent for one night, and found the patient in a violent fit of epilepsy. The attack had been lasting for an hour or two, with little or no lucid intervals. She tore her thick hair out in handfuls, and complained of severe pain in the right iliac region. I made an examination, and found that the right ovary was very much enlarged and had been dragged upward with the growth of the uterus, and was then firmly wedged between the body of the uterus and the abdominal wall. It was impossible to dislodge it. These convulsions continued almost daily, becoming so severe that I was obliged to use inhalations of nitrite of amyl in order to keep her under control and prevent her from doing herself and others some bodily harm. I assured the family that the epileptic attacks were due to the great pressure of the uterus on the ovary, and that as soon as the baby was born the attacks would cease. The baby was delivered at eight and a half months, and I could not express my disappointment and chagrin to find that my prophecy was not fulfilled, for the hystero-epileptic attacks seemed to continue with even more vigor, if anything, than before. I tried every known remedy, internal and local, used electricity, and cauterized the cervix with carbolic and with nitric acid. The attacks continued, and were only controlled by the nitrite of amyl. Finally I suggested removal of the diseased appendages, and, the family desiring a consultation, the late lamented Dr. C. C. Lee was called in. He agreed with me perfectly as to the desirability of doing a laparatomy, inasmuch as we had failed with every other form of treatment. The operation was done five years ago, and two very much diseased tubes and ovaries were removed, the uterus being in a nearly normal condition. The patient had a hystero-epileptic attack about two hours before she took the ether, and that was the last one she ever had. Two days after the operation her mind was perfectly clear for the first time in many weeks. She made an uninterrupted recovery, and is now in excellent health and spirits.

Case IV.—Miss B. is the most unique and curious case of all. She was sent to me by Mrs. Dr. Davis, of New York, two years ago. She was 20 years old and single. During childhood she was subject to convulsions with every attack of disease to which children are liable and from which she suffered, and also whenever she became anemic or excited. Menses appeared

at 11½ years of age, and she always had convulsions with them until she was 15. Under treatment the convulsions ceased for a time, except during the menstrual period. This freedom from the attacks continued for a year or more, when they came on again with greater frequency and severity. Sometimes she would have as many as a dozen hystero-epileptic attacks during the twenty-four hours. She described the aura as starting from the uterus and radiating toward each ovary, where it often stopped; but if the sensation went beyond, to the epigastrium, it always resulted in a severe hystero-epileptic convulsion. Menstruation was irregular, scanty, and very painful. Bimanual pressure over the uterus and ovaries produced a sensation of the aura, but did not produce a convulsion. She lost consciousness at almost every seizure. One year before I saw her, her stomach seemed to give out completely, and she could eat but little for nine months. Three months previous to my seeing her, her stomach absolutely refused to retain anything whatsoever of either liquid or solid character, so that when I took her case not even a teaspoonful of water had passed her lips in ninety days, and her only nourishment consisted of four enemata a day of milk and whiskey or beef tea and whiskey. It was astonishing how well preserved she looked on this slim diet. Every method of treatment had been tried with her by several well-known medical men, and all without avail. I found the two tubes and ovaries were prolapsed, enlarged, and adherent, and exquisitely sensitive to the touch. I made up my mind that all of her trouble was reflex, and advised an abdominal section. This was eagerly accepted by her family, and the operation was performed. The adhesions were very firm and hard to break up. She made a good recovery, and swallowed some kumyss on the second day, which she kept down without trouble. From this time on she could eat and drink almost anything, and to-day she is as well and happy as any one could possibly desire.

Case V.—Mrs. F., age 27, married five years, no children. Had always been a very delicate woman, of very nervous temperament. Menses first appeared at 17, severe dysmenorrhea, and never came on with any regularity. At 21 she began to have the "nervous attacks" with her menstruation, which gradually grew worse and more frequent, until she had severe and long-continued epileptic convulsions, accompanied by severe pain in both ovarian regions. By the time she was 26 years of age

the attacks were so frequent and the pain so severe that her doctor at home in North Carolina was obliged to give her morphia hypodermically. Being a weak and susceptible being, she readily fell into the morphine habit, and at the time I saw her, a little over a year ago, she was giving herself, by hypodermic injection, from six to seven grains of morphia daily. I found she had enlarged and adherent tubes and ovaries, very sensitive to pressure. I operated upon her eleven months ago and removed both appendages. The morphine habit was broken up at the same time. She had two or three slight convulsive attacks after I operated on her, but otherwise she did well. I heard from her husband less than a week ago, and he informed me that his wife continued to improve daily, had had no return of her attacks, and was fast getting to look and act like her old-time self.

This finishes the history of seven interesting cases of undoubted hystero-epilepsy. I know that there are many and diversified opinions as to the propriety of abdominal section in these cases, but where we have hystero-epilepsy to deal with, and these attacks can be directly traced to some ovarian or Fallopian irritation, and where the patient has tried and exhausted every means she can to gain relief, then I think that the operation of celiotomy is perfectly justifiable, and we certainly should resort to it to relieve our patient of one of the most distressing of the reflex neuroses.

LABOR OBSTRUCTED BY OVARIAN TUMOR.[1]

BY

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THE chief purpose of this paper is to report a case of labor in which delivery was obstructed by a cystic tumor of the ovary.

The Transactions of our Society contain no account of this subject having been considered on any previous occasion. In vol. v., and year 1880, Dr. H. P. C. Wilson, of Baltimore, read

[1] Read before the eighteenth annual meeting of the American Gynecological Society.

a paper on ovarian tumor complicating *pregnancy*, in which the question of ovariotomy was discussed; but tumors of the ovary complicating *labor* have not yet been under consideration.

There is nothing new or specially interesting in the case I am about to present: it is simply a single addition to the record of rare cases, and closely resembles others that have been previously reported. The best treatment of such cases is well worthy of discussion.

My case is as follows: Mrs. M. V. J., a strong, muscular white woman, age 38, VIIIpara, was brought to Columbia Lying-in Hospital, by ambulance, at 11:30 P.M. December 3d, 1892, in hard labor. She stated that her labor began at 8 P.M. November 29th, so that she was now three hours and a half into the *fifth day* of labor. That she should have been in active labor all this time seems almost incredible, for neither womb nor woman was exhausted, the pulse being fairly good and the pains frequent and powerful.

I saw the patient within an hour after her admission, and was informed by Dr. J. Foster Scott, the resident physician, that it was a head presentation with some sort of tumor obstructing delivery.

On proceeding to make a digital examination the first impression conveyed to the examining hand was that the presenting part of the child was about to be extruded. The perineum was distended, the anus was widely open and surrounded with hemorrhoids, the labia were considerably separated, and the vagina filled with what at the first touch one would have supposed to be the presenting head. But this distention was produced by the tumor, which so far filled the pelvic cavity as to leave only sufficient space between itself and the pubic bones to admit the passage of two fingers, by which the presenting head could be felt just beginning to enter the pelvic brim. I diagnosed a face presentation, which proved to be correct; but as I know the resident physician (Dr. Scott, who had made out a head case) to be an able diagnostician, I have no doubt the presentation was originally a head, converted later into, successively, a brow and face, as we know most face cases are. This might be accounted for by the tumor interfering with flexion. The tumor was so tense, not only during but also between the powerful pains, that it was impracticable to make out, with the fingers, whether it was fluid or solid. I therefore punctured it with a small tro-

car and canula, by way of experiment, to find out its character. The contents proved to be fluid, of a whitish, brain color, quite *in*odorous—nothing resembling the yellow or green color of pus. It was too thick and flaky to pass through the small canula, except little by little while an elastic probe was being pushed back and forth. I therefore withdrew the small instrument and passed in a larger-sized one, such as is used for paracentesis abdominis, introducing it at the same point punctured by the smaller trocar. The contents of the tumor were now discharged in a curved stream during the pains, and more slowly during the intervals, assistance being rendered by digital pressure, until the obstructing mass had disappeared, when the canula was taken out, and, with a few more strong pains, the face descended, the chin swept round to the pubes, and the child was born without further aid in about fifteen minutes. The cord was coiled once round the neck, was twenty-one inches long, flaccid and brownish in color, showing that the child had been dead some time. Efforts to resuscitate were made, but, of course, unsuccessfully. There was no trouble with the placenta, and after labor was completed the woman was cheerful and in tolerably good condition—in fact, *very good.*

I punctured this tumor from the rectum, not from the vagina. Whether this were right or wrong, my idea at the time was that the rectal puncture would be less liable to infection from the lochial discharge, and, further, that the opening made would be less liable to obstruction during labor by the pressure of the presenting part, than if it were made from the vagina. No untoward symptoms immediately followed; the woman had an easy recovery, her temperature reaching 100° only on two occasions during the fifteen days she remained in hospital before being discharged.

For some days after delivery she had vaginal douches of a 1 : 4,000 bichloride of mercury solution, while the rectum was irrigated with hot water twice daily and a suppository of iodoform introduced. Up to the fifth day a small amount of the contents of the tumor was still visible from the rectum, but not after then. On the third, fourth, and fifth days there was a little tympanites, which was relieved by pills of asafetida. She also had some quinine, and, later, some tinctura ferri chloridi three times a day.

On making an examination the day before the patient left

the hospital no remains of the tumor could be discovered, either by vaginal or rectal exploration. The recto-vaginal wall had regained its normal thinness. Convinced, however, that the cyst would most likely refill, the patient was requested to report at the hospital occasionally and let us know if anything went wrong.

Her subsequent history was as follows: She was admitted to the Garfield Hospital on January 16th, 1893—about six weeks after her confinement—and came under the care of Dr. Arthur A. Snyder, who kindly invited me to see her with him. I saw her on February 2d. She was much changed in appearance, emaciated, with fever, cough, expectoration, and indigestion. The hospital record states that she had "dulness and moist râles over the right lung," for which cod-liver oil and other remedies had been given.

On examination at this time I found the abdomen distended by a fluctuating tumor reaching two inches above the umbilicus. It was tense and very tender, especially over the right iliac region. The right foot was edematous, and there was tenderness but no redness along the course of the femoral vessels. On vaginal examination the distention of the vagina and rectum much resembled the condition observed during her labor. The tumor so far filled the pelvic cavity that the finger could barely get between it and the pubes to touch the cervix uteri, which was found high up and flattened transversely by pressure between the pubes and tumor. I advised tapping the cyst, and suggested the question of a laparatomy operation.

I did not see the case again. I was informed that the next day, while the tumor was being examined by the hospital staff, it "burst into the rectum with a profuse discharge of extremely foul-smelling pus." The patient was then taken to the operating room and an incision was made with a bistoury in the posterior vaginal wall near the cervix uteri, which gave exit to about "one gallon of offensive, greenish-yellow pus." A drainage tube was inserted and the cavity of the cyst (or abscess) was irrigated with Thiersch's solution, an antiseptic pad being afterward applied over the vulva. Stimulants were necessary to prevent syncope during the operation. Drainage and irrigation of the cavity of the cyst was continued daily for about three weeks, during which time the discharge gradually grew less in quantity and the depth of the cyst cavity diminished. On March 9th

the hospital record states her general condition to be much improved, with good appetite and digestion, lung symptoms much better. March 19th she was discharged. Cavity of abscess entirely closed. General health good.

It will be observed this history covers a period of over three months—viz., from December 3d, 1892, the date of delivery, to March 19th, 1893. I regard the case as one of ovarian tumor which had suppurated and become converted into a large abscess.

I have met with no systematic review of the literature of this subject later than the paper, so frequently quoted, and published in the London Obstetrical Transactions,[1] by Dr. Playfair in 1868. He there gives an account of fifty-seven cases, with a maternal mortality of thirteen, or 22.8 per cent. Of the nine cases treated by puncture all the mothers recovered and six of the children were saved.

In the Transactions of the Obstetrical Society of London,[2] Dr. A. H. Brewer reports a case of ovarian tumor obstructing delivery somewhat resembling my own. He states that during a violent pain the tumor burst with a sudden gush of fluid, after which the head immediately descended and was born in a few minutes. After removing the placenta two fingers were passed through a rent in the upper part of the vagina, but *not* communicating with the rectum. For a week no symptoms followed. Shortly after then the woman had pain, a chill, tenderness of the abdomen, and a fetid, offensive discharge per vaginam. Six days later the perineum was found to be "livid and distended as if by a fetal head, the anus being widely open," etc. Vaginal examination with the finger now revealed a tense swelling, and on making firm digital pressure the index finger lacerated the vaginal wall and slipped into a cavity, from which came a large quantity of fetid fluid resembling molten wax. The cavity was syringed out with a carbolic solution, the patient gradually improved to convalescence, and at the end of three weeks "passed a peculiar-looking, dry membrane, the cyst wall of an ovarian tumor." She got well and had another child a year afterward.

In discussing cases of this sort the question of treatment—the *best* treatment—is, I think, of great importance. When the tumor is large and below the pelvic brim, and cannot be pushed

[1] Vol. ix. [2] Vol. xx., 1879, pp. 184–188.

back to make room for the child, the only modes of proceeding available would seem to be: (1) abdominal section of the mother, (2) mutilation of the child, or (3) puncture of the tumor. Playfair's tables (already referred to) gave the best results from puncture of the cyst.

In cases where the tumor is smaller and capable of being pushed up out of the way of the child, it becomes an interesting question whether such a method of treatment, with its well-known risks, would be better than emptying the tumor by puncture.

In cases where the tumor has been punctured or ruptured, and delivery is over, what constitutes the best subsequent treatment—immediate and remote?

These questions and others allied to them are, I think, quite unsettled and deserve serious consideration.

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THE ABDOMINAL BRAIN IN GYNECOLOGY: ITS REFLEX AND ITS RHYTHM.[1]

BY

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Chicago.

I WISH to make a few remarks on the anatomy, physiology, and pathology of the sympathetic nerve, showing what are the principal points in gynecology relative to the abdominal brain.

The sympathetic nerve consists of two lateral chains of ganglia extending from the base of the skull to the coccyx. Situated anterior to these chains are two collateral plexuses, known as the cardiac and abdominal. Besides these there exist in all the viscera small ganglia which I shall term automatic visceral ganglia—for example, the automatic hepatic ganglia, the automatic cardiac, menstrual, and vesical ganglia. The distribution of the sympathetic nerve is (*a*) to blood vessels, (*b*) to glands, and (*c*) to viscera. It is connected with the cerebro-spinal nerves by the rami communicantes. Its independence of the cerebro-spinal axis is not yet fully settled. But babies are born at term

[1] Read before the Gynecological Society of Chicago, January 3d, 1893.

with no cerebro-spinal axis. The part of the sympathetic that appears the most independent of the cerebro-spinal axis is that supplying the uterus and the digestive tract. I have kept the intestines of dogs in active peristaltic waves nearly two hours after death in a warm room by tapping them with the scalpel. I have watched the uterus of a cow keep up its active motion for nearly two hours after she was dead, with no irritation applied to it. The anatomical parts of the sympathetic to which I wish to direct attention are the cervical sympathetic ganglia (superior, middle, and inferior) and the abdominal brain (the solar plexus). Due consideration must be given to the three splanchnic groups.

1. The cervical splanchnics, conducted to the stomach, heart, and lungs through the spinal accessory, and the vagus.

2. The abdominal splanchnics, originating from the fourth dorsal to the second lumbar, and running to the abdominal brain.

3. The pelvic splanchnics, conducted to the hypogastric plexus by means of the second and third sacral nerves, to supply the rectum and genito-urinary organs. It may be noted as a fact that I have observed for some time that the connection of the genital and urinary systems with all the great nerve centres is intimate and very large. For example, the organ which has the most intimate and profound connection with the cerebro-spinal axis and the abdominal brain is the uterus. The eye is also an organ closely connected with the uterus and both nervous systems. The intimate nervous connection of the uterus with the nervous system increases with the ascending scale of animal life. We can say that the dominant idea of any animal race is the sexual idea. Sexual ideas are the more profound and widespread as animal life becomes higher and more complex.

The *physiological* function of the sympathetic is *rhythm*. Only the sympathetic nerve has rhythm, and rhythm belongs only to a ganglion. The viscera functionate rhythmically. The destruction of rhythm causes disease. The organs which have the most pronounced rhythm are those most intimately connected with the abdominal brain. The organ which has the most profound connection with the abdominal brain is the uterus, and its rhythm is very apparent. So far as I can observe, the uterus is connected with the abdominal brain by twenty to thirty strong nerve strands.

1. The uterus and tubes have a monthly rhythm, due to the

automatic menstrual ganglia situated in their walls. No doubt the higher physiological actions originate in the great abdominal brain. This may explain why at times tuberculous girls do not menstruate. The abdominal brain is unable from exhaustion to initiate and sustain a rhythm, or in such weak girls a slight event will inhibit a menstrual rhythm. No doubt many such girls have a deficient abdominal brain. Pregnancy and lactation steal away nourishment, and thus rhythm is inhibited. The tubal rhythm may be watched with the most advantage and profit in slaughtered cows. Here it can be observed in all its stages. It is the breaking of the rhythm of one viscus that disturbs the rhythm of all the rest; and among all none is so significant as the uterus.

2. I wish to show that the liver has a visceral rhythm, through its *automatic hepatic ganglia*, similar to that of the uterus. The occasion of an hepatic rhythm is food carried to it by the portal vein. For example, when fresh food arrives in the liver from the portal vein the cells of the liver begin to swell. The liver cells are going through their function of making bile, glycogen, and urea. The liver is enabled to swell because it has an elastic capsule, known as Glisson's capsule. It can also swell because the peritoneum covering it is extremely elastic. Hence the liver can go through its rhythm (1) by its cells swelling, (2) by the stretching of Glisson's capsule, (3) by the expansion of the peritoneum covering the liver. When the liver arrives at its maximum point of the rhythm the cells have exhausted themselves in making bile, glycogen, and urea. These three products are sent home, and the cells begin to contract, Glisson's capsule shrinks, and the peritoneum closes back to its original state. Now the liver gets rest, repose, and repair, in order to be again able to produce and accomplish a rhythm. It is the breaking of the hepatic rhythm by bad food or distant reflexes of diseased viscera that causes disease in the liver. The most prominent organ that induces irregular hepatic rhythm is a diseased uterus. Alcohol taken without food destroys the nice balance of the hepatic rhythm by falsely alarming the liver to go through its rhythm without due stimulus or by unnatural stimulus.

3. It is plain that the heart goes through a rhythm by means of its automatic cardiac ganglia situated in its walls. These ganglia are known as Bidder's, Schmidt's, Bidder's, and Lud-

wig's. The vagus (especially the right) gives the heart its slow, steady beat, its sober, regular movements like a pendulum. But it is the three cervical sympathetic ganglia that rule the heart in regard to rapidity and irregularity. Disturb the three cervical sympathetic nerves that go to the heart, and it will run riotously and irregularly. It will palpitate, or stand still, or move at irregular rates. It is the breaking of the cardiac rhythm that causes heart disease in gynecology. A diseased uterus is preeminently the organ that disturbs the heart in its rhythm.

4. The digestive tract has its own special rhythm through *Auerbach's plexus and Meissner's plexus.* Auerbach's plexus is situated between the longitudinal and circular muscular layers of the digestive canal, and stimulus applied to it induces peristalsis. It controls bowel movements, which may be turbulent, producing colic, or insufficient, causing constipation. Meissner's plexus controls digestive secretions, and stimulus applied to it may induce (*a*) too much secretion, (*b*) too little secretion, or (*c*) disproportionate secretion. The last is a fruitful cause of fermentation. The occasion of a digestive rhythm is food. The main rhythm occurs in the small intestine and stomach.

5. The bladder goes through a rhythm by means of its *automatic vesical ganglia.* It has a diastole and a systole—*e.g.*, the rhythm of the bladder is broken when its nerves are dragged on, as in pregnancy.

6. The spleen performs its rhythm by its *automatic splenic ganglia.* The occasion of a splenic rhythm is fresh food. The spleen accomplishes its rhythm by (*a*) the swelling of its tufts and substance, (*b*) by the expansion of its elastic capsule, and (*c*) by the stretching of its peritoneal covering. It rises to a maximum and sinks to a minimum. It is now in action and now in repose.

Thus each viscus performs its rhythm by means of its automatic ganglia situated in its substance. Of course the higher physiological orders of the abdominal brain must be obeyed.

We now come to the consideration of diseased viscera. Pathogenesis through the sympathetic in *health* and *disease* is by reflex action. Of course we have ganglionic sclerosis, recognizable and non-recognizable lesions of the sympathetic, pigmentation and secondary diseases, etc., but the great pathology of the sympathetic nerve in gynecology is the transmission

of reflexes from diseased viscera. I wish to explain in a simple way the results of several years of labor and investigation on the sympathetic nerve. I wish to show that through this reflex action of the sympathetic nerve we can account for many diseases of women. We will take the case of Mrs. S., who suffered a cervical laceration five years ago, and who now is a neurotic, pale, anemic woman, unfitted for labor or life. The laceration was soon followed by *endometritis*. Irritation from this was transmitted up the hypogastric plexus to the abdominal brain, where it reorganized. It should be remembered that any irritation (force) will travel on the lines of least resistance. The direction of least resistance from the abdominal brain is toward that organ having the greatest number of nerve strands. But the irritation, reorganized, will flash out on all the plexuses. (*a*) Suppose we follow the irritation from the abdominal brain to the liver over the hepatic plexus. When the irritation which started from the uterus arrives at the liver, it will disturb its rhythm by inducing the liver to secrete (*a*) too much (bile, glycogen, and urea), (*b*) too little (bile, glycogen, and urea), or (*c*) disproportionately (bile, glycogen, and urea). However, finally the rhythm of the liver is disturbed and its function impaired. Now (*b*) suppose we follow this same uterine irritation to the digestive tract. The diseased endometrium sends its irritation up the hypogastric plexus to the abdominal brain, where it is reorganized and flashed over the gastric, superior and inferior mesenteric plexuses of nerves. When the irritation arrives at the gut wall the first disturbance arises in Auerbach's plexus. This will cause too much motion (colic), too little motion, or irregular peristalsis. As the irritation passes on to the plexus of Meissner it induces these ganglia to allow (1) too much secretion, (2) too little secretion, (3) or disproportionate secretion. Here three things may result—viz., (*a*) diarrhea, (*b*) constipation, or (*c*) development of gases or fermentation. The final scene is indigestion. Thus, after six months to two years, Mrs. S. has arrived at indigestion. It was all brought about by irritation arising in the uterus, which sent its reflexes to all the viscera, destroying their rhythm.

2. The second stage of Mrs. S. is malnutrition. It simply resulted from long-continued indigestion.

3. The third stage is anemia from malnutrition.

4. The fourth stage is neurosis from the ganglia being bathed

in waste-laden blood. Hence endometritis may induce (*a*) indigestion, (*b*) malnutrition, (*c*) anemia, and (*d*) neuroses.

Again, take the heart palpitation at the menopause. It is explained by reflex action. The seedtime and harvest of woman is thirty years. During that time regular monthly forces had been transmitted over the hypogastric plexus to induce uterine and tubal rhythm. Now, at the menopause, the hypogastric plexus degenerates and will not carry the forces, so the forces accumulate. The accumulated forces in the abdominal brain go up the splanchnics to the three cervical ganglia, where they are reorganized and flashed down to the heart, whence it works either too rapidly or irregularly. This explains palpitation at the menopause. Exactly the same explanation suffices for liver disease at the menopause. At the menopause the heat and sweat centres are irritated, and the woman has heats and flushes and spells of sweating. Pigmentation is also from reflex action. The irritation spends its main force on the liver and spleen to cause pigmentation.

I wish to say a word in regard to the theory advanced by Dr. Bacon. Dr. Bacon advocates the idea that flexions of the uterus may be due to long-continued reflex irritation. Now, it is generally recognized by careful observers that long-continued irritation of a muscle will produce fibroid degeneration, and that this fibroid degeneration will end in connective tissue; also, that the tendency of cicatricial tissue is to contract. This has been quite well demonstrated in regard to spinal nerves. Dr. Bacon to-night presents the ingenious idea of transferring the same idea to the muscles supplied by the sympathetic. At first thought I am inclined to agree with Dr. Bacon, though more mature thought may change my opinion. I would add that the nourishment of muscle is probably similar whether it be supplied by a spinal nerve or a sympathetic; also, that it is likely the same whether it be striped or unstriped.

Another principle may also be said in favor of the theory of Dr. Bacon, and that is, reflex irritation started on the smallest branch of a nerve will be emitted with the greatest force along the largest plexus to which the nerve belongs, for that will be in the direction of least resistance. Take, for example, the small branches of the pudic nerve, which supplies that part of the rectum subject to hemorrhoids. If a hemorrhoid is amputated the reflex irritation is often reflected over the pudic and down on

to the bladder by the great vesical branch of the third sacral, and retention of urine results. The same principle may apply to rectal irritation being transmitted up to the abdominal brain by way of the lesser mesenteric plexus, where it is reorganized and emitted down the great hypogastric plexus to the uterus. If this irritation is long continued it may produce fibroid degeneration of parts of the uterine muscle, which results in cicatricial tissue. The cicatricial tissue shrinks and flexes the uterus. Whether Dr. Bacon's theory be true or not, there is no doubt the gynecologist will learn much from the rectal specialist. As the gynecologist acquires more knowledge of the rectum it is likely less celiotomies may be done.

MEMBRANOUS DYSMENORRHEA.[1]

TREATMENT BY CURETTAGE AND THE APPLICATION OF A TWO AND A HALF PER CENT SOLUTION OF CARBOLIC ACID—WITH CASES.

BY

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In 1879 I read before the Ohio State Medical Society a paper on the "Treatment of Membranous Dysmenorrhea," reporting one case. The manuscript was not furnished to the publishing committee and does not appear in the Transactions of the Society. The case then reported is Case 1 in the present paper.

Case I.—Mrs. T., a blonde 28 years old, who had been married ten years, consulted me for the relief of painful menstruation. She was decidedly of nervous temperament. General health good, fairly nourished, but suffered from uterine catarrh and had painful menstruation. She was from the middle class of society, and before and after marriage led an active life, assisting in the domestic duties of the household.

This history was obtained: She menstruated first at 15. The function was regular, but always attended with considerable pain until her marriage at the age of 18. Fifteen months after marriage she aborted at the third month.

[1] Read before the annual meeting of the American Gynecological Society, May 16th, 1893.

After the abortion she missed two menstruations. The function was now again established, but was quite painful. At the end of one year, at each period large shreds of membrane were discharged with intense pain. When she came under my care, and for two years previously, complete casts of the uterine cavity were thrown off at each menstrual epoch, the suffering being so unbearable that morphia in full doses had to be administered.

On two separate occasions the casts were secured by me and subjected to microscopic examination. The first was examined by the late Dr. Stallo, who reported it to be mucous membrane, the glandular structure, and the small-celled proliferation in the interglandular tissue, being well marked. Total absence of chorionic villi left no doubt as to its character. The examination of the next specimen gave precisely the same results. As to the diagnosis there could be no doubt. Conception had not occurred since that which resulted in the abortion above noted.

This woman was subjected to the following treatment: Five days prior to the date when the next menstruation was due, the bowels having been evacuated and all other necessary preparations made, she was anesthetized by ether and the uterus was thoroughly curetted, first with a Sims sharp curette, then followed by a dull wire curette much after the pattern of Thomas' blunt wire curette. The instrument used, however, is not flexible, as is that of Thomas. Flexibility in any curette is, to my mind, objectionable, as it renders the amount of pressure that can be made uncertain and the work done correspondingly imperfect. The os in this case was sufficiently patulous to permit of the easy introduction of the curette. No previous dilatation was therefore necessary. The curettage completed, the cavity was cleaned out by cotton dampened in a one-per-cent solution of carbolic acid and carried repeatedly into the uterus by means of a slender, curved uterine dressing forceps similar to the instrument here exhibited.

The manipulation was continued until the cotton wads, on withdrawal, were but little discolored with blood. Now small wads of cotton, saturated with a two and a half per cent solution of carbolic acid in water, were carried into the cavities and the walls thoroughly mopped. At least twenty applications were in this way made. Care was taken that the quantity of cotton in the forceps should be small, otherwise the acid solution would

be squeezed out during passage through the cervical canal. A small strip of iodoform gauze was rolled loosely and placed within the vagina, and the patient put to bed, and a small water bag, cold, placed over the uterus.

The patient was kept in bed for nine days. Considerable blood and serum was discharged for three days after curettage. The menstruation which was due was missed.

On the fourteenth day after the first treatment it was repeated, with this difference: only the dull curette was used and the scraping was not so vigorous. The pieces of mucous membrane removed were neither so large nor so thick as those obtained at the first curettage, this being, of course, due to the fact that, notwithstanding the rapidity with which the endometrium is reproduced after removal by the curette, it had not in this case had time for complete development. Certainly it had not attained to the abnormal thickness characteristic of the structure exfoliated during a membranous menstruation. Then the dull curette, though competent for removal of all the mucous membrane of the uterus except the deeper part of the glandular structures which dips down into the muscular layer, does not remove it in clean-cut pieces, as does the sharp curette.

On the fifteenth day after this second curettage and application of carbolic acid, the operation was the third time done, in precisely the same manner as the second. At the expiration of seventeen days the operation was done for the fourth time. No important reaction of temperature or pulse followed either of the treatments.

All treatment was now discontinued. It will be observed that the first curetting was done about five days before a menstrual period; the second, about four days after it should have been over, had it come on; the third curetting was about four days before the next menstruation was due. This menstruation was also missed. The fourth and last curetting was done about five days after the probable close of this menstruation, had it occurred.

At the third menstrual period after treatment was commenced the discharge appeared, but about two days late, lasting but three days. No membranes discharged; but little pain.

At the next period she menstruated without delay, the discharge, normal in character and quantity, lasting four days. No pain. Conception occurred soon after, and she was delivered at

term of a healthy male child. This lady is now living and is the mother of three children. There was no return of the disease.

CASE II.—Mrs. W., a woman of highly developed nervous organization, good general health, of superior education and refinement, came under my care when she had been married thirteen years and was the mother of one child, now 11 years of age. After graduation at a boarding school this lady had taught for two years, marrying at the age of 25 a gentleman ten years her senior, who was a widower with one daughter by a former wife. This marriage brought wealth and exalted social position, with the tax upon physical and moral resources too often associated with social dissipation.

History.—Menstruation had been established at the age of 15, but during school life the function had been somewhat irregular. She had, on two or three occasions, gone two consecutive months without menstruation. Had been anemic. Had menstruated with regularity, but with much pain, for past two years before marriage; also suffered from uterine catarrh.

Menstruation was re-established ten months after the birth of her child. It was regular, and attended with but little suffering, for eighteen months. She now missed one period and supposed herself again pregnant. One week before the second period was due a scanty, bloody discharge commenced, continuing five days and attended by severe pain. Nothing was expelled during this attack to confirm the suspicion of pregnancy and abortion. Menstruation occurred at the following period, continuing six to eight days, and attended with great suffering. From this time on to the time when she came under my care menstruation had been painful, and for the past two years shreds of membrane, and in some instances complete casts, had been discharged. As on several occasions menstruation had been delayed for a week or more, and was then accompanied by the masses referred to, she felt positive that she had had frequent abortions. This belief was probably the more firmly established in her mind because of her ardent desire for another child.

An examination of the membranous casts led me to believe it to be a case of membranous dysmenorrhea. Microscopic examination of the casts obtained at two different periods, made by Dr. Kebler, fully confirmed this diagnosis.

This patient was placed upon treatment in every particular,

both as to time and methods, similar to that employed in Case 1. The cervical canal, however, had to be dilated by an Ellinger dilator in each instance before the curette would freely pass. The contraction, which also occurred under the stimulation of mopping out with the carbolic solution, rendered redilatation after curetting necessary in order that the application might be made sufficiently thorough.

Results.—The establishment of normal menstrual discharges, at the proper dates, and not attended with pain. This woman, whose habit was rather slight, gained twelve pounds in weight. Pregnancy, however, did not again occur. Two years subsequently she had a relapse of the old symptoms, but the quantity of membrane discharged at each period was much smaller, and suffering was also less than in the former attacks. She was again subjected to curettage and acid. But three treatments were administered. Complete relief followed. She continued to menstruate normally and free from pain. Has now reached the menopause; is in the enjoyment of robust health, and is a widow.

Case III.—Miss W., a daughter of the lady whose case has just been reported, and who was 11 years old when her mother came under my care, was, at the age of 18, placed in my charge for relief of dysmenorrhea. She first menstruated at the age of 14 years. Had suffered more or less from the first. Now, however, she thought her suffering had become unbearable. She was of slight stature, bright, vivacious, nervous; quite anemic. No cough, no disease of lungs, heart, or kidneys, could be detected. Heart's action rapid and irritable, anemic bruits well marked. No examination of the pelvic organs was made. She was ordered to quit school and study, to take free exercise in the open air, to have cold sponge baths each morning, and to have one grain of ferrum redactum with one and a half grains of quinine sulphate in capsule three times daily. Under this régime general health improved some. She gained ten pounds in weight; better complexion; heart's action slower. Painful menstruation, however, continued. She now went abroad for more than a year; travelled in England and on the Continent; studied the French and German languages.

On her return her menstrual suffering was most severe. Morphia at each period had been resorted to. The periods were now sometimes delayed a week. Many and large shreds of

membrane were expelled each time. Finally a complete cast of the uterine cavity was saved for my inspection. Its macroscopic examination left in my mind no doubt.

A microscopic examination of the specimen, made for me by Dr. J. M. French, was conclusive. This patient was placed in my private hospital, and, after due preparation, was etherized, curetted with both the sharp and the blunt curette, followed by the acid, as in the other cases. The time selected, as to the expected menstruation, for the first curettage was, as in the first case, about five days before the discharge was due. Each subsequent treatment was also at dates corresponding to the first case.

In this patient the examination, made before the operation was commenced, showed the uterine cervix to be quite small, slender, and conical. Indeed, it was an approximation to the condition found in the so-called infantile uterus. It was with considerable difficulty that the smallest-sized Ball uterine dilator could be introduced to make way for the smaller-sized Ellinger dilator. It required at least a half-hour for sufficient dilatation to permit of the easy introduction of the curette. It is important also to note that in this case the sound measurement, before curetting, showed depth of the cavity to be three and a quarter inches.

The menstruation due after the first curetting was missed, a slight bloody discharge being continuous from the day following the treatment for about seven days. The next menstruation, although following so closely upon a curetting, appeared, lasting four days. The quantity of blood lost, however, was slight. The third menstruation was in every way normal and without pain. She is now in the enjoyment of excellent health, is a most accomplished equestrienne, and indulges in the sport most freely.

These cases have, I fear, been recited with too much detail and commonplace for the entertainment of a society of the character of the one that I have the honor to address. But my excuse may, I hope, be found in the fact that the results of treatment in these cases are rather exceptional. Relief has followed many plans of treatment, but permanent cures are by all acknowledged to be of rare occurrence. It was therefore deemed proper that such details should be given as would enable you to judge correctly as to the character of the cases and the relations of treatment to cure.

Several matters of detail may with propriety be specially noted. First, the repetition of curetting so soon as the mucous membrane had time to form after removal—indeed, before its full regeneration was complete. This I regard as an essential element to success. Second, the absence of inflammatory or infective reaction, notwithstanding the rapidity with which one curettage followed another. This, of course, is explained solely on the ground of aseptic methods and antiseptic precautions, in which there is nothing new or novel. In this connection it cannot be doubted that the free use of carbolic acid was the important and chief agent. Its use, notwithstanding the weakness of the solution, was unquestionably an important factor also in modifying the inflammatory conditions which underlie the perverted membrane formation. It is my opinion that in this respect its action, if employed immediately after curettage, is far better than the action of more concentrated solutions of this or other agents, applied at the time or subsequently with a view to caustic action. Such practice in these cases I consider positively injurious.

The method adopted for applying the acid I consider in such cases better than by injection.

Mention has already been made of the rapid repetitions of curettage. In my opinion herein lies the chief element in securing the complete results. A single curettage, or repeated at long intervals, no matter how thoroughly done, fails to modify sufficiently the regenerative process.

This paper is strictly clinical and confined to treatment; I shall therefore not discuss causation. It will, however, be inferred from the plans of treatment adopted that I accept as most probably true the opinions at present most current regarding its inflammatory character. There must also unquestionably be important factors referable to the nervous system and processes of nutrition.

DANGERS AND COMPLICATIONS OF UTERINE FIBROIDS.[1]

BY

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THE many articles written and published within the past few years upon the various methods of performing hysterectomy for uterine fibroids, indicate that the profession is fast awaking to the fact that these growths are not the simple, inoffensive, uncomplicated neoplasms that we were taught to believe in our early professional life. We were taught that they were comparatively harmless during menstrual life, were generally absorbed after the menopause; so that he who even suggested any surgical interference, especially hysterectomy, would have been severely criticised by the conservative, judicious members of the profession. In fact, within the past year one of our ablest medical journals has indulged in a most sarcastic editorial against those surgeons and gynecologists who have been most forward in urging operations for removal of the uterus when so affected. Nevertheless the work goes on and the "world moves." Hysterectomy is being performed every day, and the mortality is not any greater than that from ovariotomy ten years ago. The "conservative" man may say that this is far too large for a disease that is attended with so little danger to life as the one under consideration. In reply it may be said that death is not the only phase of the matter to be considered. Physical suffering and chronic invalidism far outweigh the other factor. This latter condition has not, in my opinion, been fully appreciated by the profession generally. The literature is very meagre on this point, and the observers have not published the results of their observations.

One year ago I read a short paper before the American Medical Association (Section on Obstetrics and Diseases of Women), in which I claimed that hysterectomy for uterine fibroids "is the only proper conservative surgery, and that it can be made equally safe with that of ovariotomy at the present day." In

[1] Read at the eighteenth annual meeting of the American Gynecological Society.

the course of the discussion I found but one or two who were favorable to this presentation of the case, while the general tenor of the arguments was that only in a comparatively few cases were such radical measures justifiable, inasmuch as the mortality and suffering were so very insignificant when the cases are left to run their course.

My own observations up to that time had shown me many cases of death from this cause, and untold suffering added to wretched, useless lives. Within the past year I have more carefully kept notes and records of the cases upon which I have operated, and that have otherwise consulted me, with the view of presenting the prominent features of the worst cases.

The great aim of the profession should be to give the greatest good to the greatest number, and I submit the question whether the mortality of ten or even fifteen per cent should deter us from operating where such undoubted good results are accomplished as in hysterectomy—results that are superior to those found after ovariotomy and oöphorectomy, and for obvious reasons: viz., the entire genitalia are removed, and no further trouble is expected, as happens frequently where a heavy, hyperplastic, displaced uterus remains.

I fully believe if it were the rule that in every case of fibroid of the uterus we made hysterectomy before the patient was exhausted by hemorrhages, peritonitis, salpingitis, and consequent invalidism—in short, if we operated upon all cases in the early stages, as we all advise now for cystoma of the ovary—that our mortality would be no greater, and at the end of a year we would have a much greater sum of human happiness and relief to physical suffering. "It is not all of life to *live*, nor all of death to *die*," when *dying* ends years of agony, mental and physical. The patient and friends demand relief from us, and if we offer that which in a very large percentage of cases gives it, they are willing to accept the risk rather than bear the "ills they have."

The most conservative in the profession are well agreed that we should make hysterectomy, in rapidly growing fibroids at or near, and especially after, the menopause, for excessive bleeding that cannot be controlled by ordinary means, for repeated attacks of peritonitis caused by pressure, for pyosalpinx or other severe forms of salpingitis, for sarcomatous, carcinomatous, calcareous, or cystic degenerations of the fibroid. These same

"conservative" men deplore that the operation could not have been made earlier, knowing that the chances for the best success have been lost by delay; and yet the very next case that they see in which no complications exist they very gravely advise waiting till they do exist. The "jewel of consistency" does not seem very brilliant, to my limited vision, in such advice. It certainly is not "for this we are doctors." I am sure that if the profession can become well satisfied that danger lies in delay, that there are a sufficient number of these complications to offset the dangers from hysterectomy, they are only too willing to advise that which offers, on the whole, the greatest good. But, at the same time, I insist that mortality from hysterectomy shall not be the only element to be considered in deciding for or against an operation. Physical suffering is a large factor with the patient, and I repeat that she is more than ready to take her part of the risk for the hope that lies beyond. When you add to the physical suffering the mortality of fibroids left to their natural course, I think we have a large preponderance of testimony in favor of the operation. I venture the assertion that the deaths from this cause will fully equal that from operating, provided all cases are operated upon as early as I advocate. We have left, then, in favor of surgical interference the relief and cure of this immense factor—years of suffering and invalidism.

Among the cases of complication that I have observed are the following: Prior to the past year sarcomatous degeneration of a large fibroid, apparently commencing in the centre; this I have found in not less than three cases. One case calcareous degeneration; in this case I made Hegar's operation, removing the appendages from each side, which stopped the growth; but, as it did not absorb, at the end of two years it was so painful through the pelvis that I made hysterectomy, and found the whole mass so completely calcareous that I was obliged to use a saw to make a section. She made a good recovery and has since been a healthy woman, while for at least ten years before she had been entirely unable to do her housework. I have seen but one fibro-cyst in my own practice, but have seen two or three in consultation. A recent case of sarcomatous degeneration of a fibroid came under my observation at the Maine General Hospital. The patient died after operation, from the destruction consequent upon the malignant degeneration, adhesions, etc.

One case where softening occurred in an enormous fibroid, from which two others grew very rapidly; beneath the whole mass was an intraligamentous cyst of each ovary. The suffering was so great that I attempted operation, but she died from shock and hemorrhage within a few hours. Dr. Homans saw this case in consultation and believed operation justifiable. Had she been operated on when I first saw her five years before, I have no doubt as to the result.

Within the past year I have made as many as twenty hysterectomies for various purposes, mostly fibroids. Four cases have died. One was an epileptic. One had malignant sarcomatous degeneration. A third had suffered from repeated attacks of peritonitis and terrible floodings, for which I had curetted with only temporary relief; the adhesions were very extensive, and the whole mass made up of a large number of very hard, nodular fibroids. Fourth case, interstitial fibroid, uterus bound down by adhesions; had severe hemorrhage from vagina soon after operation, and died three days after. In no one of the cases of death was there simple, uncomplicated fibroid. A very frequent complication was cystic ovaries, and in quite a large percentage I found pyosalpinx, and abscess of ovary in several.

In nearly every one of the twenty cases there was some complication that was an element of danger to life or delayed operation and prolonged recovery. Had operation been made early all this could have been saved. All of these women had been invalids for years, and, to use their own expression, had arrived at that point where "life is a burden."

In some of the cases the tumors began a rapid growth after menopause. One case in particular I had watched for several years, had curetted twice for hemorrhages, but the tumor did not increase much in size until the menopause was completely established. Within one year after, the tumor increased to double its size. The pain and discomfort increased and she insisted upon operation. Her recovery was complete.

The operation that I make is a simple one, mostly by suture with catgut, ligating the broad ligament beneath the Fallopian tube close to the uterus with silk, then with a strong catgut suture at a point an inch outside, cutting and sewing over and over the broad ligament down each side until the uterine artery is reached, when I dissect off the peritoneum in front and

behind until I enucleate the cervix. I then close the peritoneal flaps. No drainage.

Conclusions.—1. Uterine fibroids are always more or less troublesome, and in a large majority of cases produce a state of chronic invalidism.

2. In a large percentage of cases they are complicated with excessive hemorrhages, peritonitis, salpingitis, and ovaritis, with purulent collections and adhesions, producing continual suffering.

3. Many of them do not cease growing at the menopause, but increase.

4. Many undergo degeneration, either calcareous, cystic, or malignant.

5. Hysterectomy is not a very dangerous operation if made in the early history of the case—no more so than ovariotomy.

6. In addition to the saving of life, it relieves (in nearly all the cases) the woman from a life of invalidism.

157 HIGH STREET.

DIGITAL CURETTING OF THE PUERPERAL UTERUS.[1]

BY

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YOUR attention is requested for a few moments to the subject of digital curetting of the puerperal uterus, with especial reference to the treatment of incomplete abortions and that of adherent secundines.

So much has been written about these subjects and their treatment, and so thoroughly and clearly have they been dwelt upon, that it would appear there is nothing further to add. Nevertheless I am indebted to several members of this Society for the opportunity of creating this article.

Several months ago, during the discussion following a paper read before the Chicago Medical Society upon some obstetrical subject, several gentlemen, well and widely known as teachers of obstetrics, and recognized here as authorities, expressed strongly opposing views concerning the best methods of remov-

[1] Read before the Chicago Gynecological Society, February 17th, 1893.

ing adherent secundines. Some did not hesitate to introduce the finger into the uterus, and with the tip of the finger armed with the nail detach and remove adherent particles, whether of placental or membranal origin, following this digital removing by thorough uterine irrigation. Others were surprised to hear of such a procedure being advocated. They believed that, with the conditions noted, an instrument only should be used, as the danger from infection was greater with the finger than with the instrument. The principal objection brought forward was that of increasing the danger of infection from the finger, especially the nail; though it was suggested that by the liberal use of the nail cleaner and finger brush the offending member might be as thoroughly cleansed and asepticized as the instrument curette.

Here we have presented two views diametrically opposite, both advanced by teachers. Which shall we adopt? Are they equal, or has the one any advantage over the other?

To those who will say, What difference does it make, or, much better, Does it make any difference whether the instrument or the finger be employed to curette, so long as the uterus be emptied? let me make answer, it does make a difference, and in many cases a great and serious one.

It is held by some that the introduction of the finger exposes the patient to more danger of infection than the instrument. From my experience and observations I have no hesitancy in stating that I do not agree with these gentlemen, and believe that just the reverse holds true—namely, that the instrument exposes to the greater danger because of the greater traumatism following its use, the fact that often the fragment or fragments are not found or touched by the instrument, and because the subsequent danger of infection is thereby increased. These are a few of the reasons why the position assumed is taken; others will be presented below.

That this diversity of opinion is not local is shown in the history of the following case occurring during my service in the polyclinic abroad.

Was called to attend a woman troubled with floodings. Upon arrival I found the woman in bed with pale, cold, clammy skin, anxious countenance, small, weak pulse, respiration at lengthened intervals of a deep, sighing character, and suffering from marked exhaustion. Inquiry brought the information that eight days

before she had had an incomplete abortion. Much blood and many clots had passed away; she had noticed the embryo, but not the placenta. A midwife had been caring for her, but, hemorrhages continuing, she reported the case to the polyclinic.

Most probable diagnosis, adherent placenta. After thorough irrigation of the vagina and cleansing of the hand, introduced two fingers into the vagina. Explored the vagina to assure myself that it was free from any cause producing hemorrhage. Continuing the exploration, found the cervix soft and patulous. Introducing the tip of the middle finger, which I always prefer in such cases, into the cervical canal, it immediately came in contact with a spongy, fleshy mass, characteristic of placental tissue, projecting into and occluding the canal. Introducing the finger further up and through the cervical canal into the uterine cavity, I found that though a portion of the placenta had been detached and forced into the cervical canal, a larger part, continuous with the already detached portion of the placenta, was still adherent. Without further delay I detached and removed the secundines by means of the finger and its nail used as curette. After thus detaching and removing all the fragments, I gave a uterine douche, completing the operation by massaging the uterus, thus encouraging uterine contractions. When through noticed that the continued trickling of blood had ceased. Did not administer ergot. Called but once thereafter, as patient did well and soon recovered.

When reporting the case at our weekly "Referat-Stunde," exception was taken by the privat-docent to my introduction of the finger and digital curetting; he suggesting that it would have been better to have waited, meanwhile administering ergot, that where curetting was indicated it was better to have recourse to the instrument. Nevertheless I continued in the belief that the method of treatment adopted in this particular case was the better one.

While in Vienna another case bearing directly upon this subject presented itself, whose history and termination materially strengthened me in the position previously taken. Privat-Docent Zehman, in making a post-mortem upon a well-developed multipara, removed and opened the enlarged subinvoluted uterus, and found, situated high up in the posterior superior part of the arch, what was at first thought to be a cystic fibroid, of about the size of half a globe whose diameter would be about

one inch and a half, and which a microscopical examination showed to be placental polyp.

The principal points in the case, as well as I can remember now, are as follows: Case, multipara, sent from ——, had been confined some four weeks previously; child delivered normally. I think Credé's method was employed for the delivery of the placenta. The first week after labor passed without anything of moment. During the second week, noticing that the lochia continued excessively bloody and profuse in character, suspicion was entertained of subinvolution with retained secundines. Vaginal causes being ruled out, irrigation of the uterus with instrumental curetting followed. The sanguineous lochia still continuing into the third and fourth weeks, the curetting was repeated several times, but without checking the metrorrhagia. From loss of blood, exhaustion, and the inflammations which had developed, death followed at the end of the fourth week.

This case seemed to me of special value and of peculiar interest. I could not help but ask, Why did they—and they were certainly very technical and scientific gentlemen—why did they not simply introduce the finger into the uterus and explore? Even with little skill the true nature of the difficulty would readily have been recognized. As it was, notwithstanding the repeated instrumental curettings by intelligent hands, the adherent placental fragment, rapidly developing into a placental polyp, was not touched by the curette, nor had the surface of the polyp been disturbed by the curetting.

Let us consider what happens in a case like this: The soft decidua vera, giving the sensation somewhat like that of placental tissue, is scraped away by the curette; the curetting being repeated, the deeper, newly developing utricular membrane is disturbed, and next the superficial uterine layers (muscular) will be exposed to the action of the instrument, thus lacerating and tearing open the previously closed channels of the blood and lymph vessels—just the condition we must endeavor to prevent. Suppuration with infection taking place, as it did in this case, what follows? General infection, puerperal septicemia, possibly death, due in the main to the artificially produced traumatisms following the non-diagnosis and instrumentation.

How easy it would have been to have avoided the fatal omission, in the case we have considered, had the finger been used, if only for purposes of diagnosis.

After such an experience I felt warranted in advocating the introduction of the finger into the uterus, and, if the indications required it, the use of its tip, armed with the slightly projecting nail, as a curette in all cases of adherent secundines.

We know that in many cases the finger is the only means we have of clearing away any and all such doubt. Should any cause be ascertained for that doubt, why not clear it away at the same time and with the same means?

The various tissues with which the finger or spoon engages in curetting present more or less difficulty of interpretation. It is true that the decidua vera may be easily recognized, but equally true that the decidua serotina is difficult of interpretation—not for the finger, but for the spoon, as its area is raised, presenting a broken, rough, uneven surface, due to the irregular projection of its fleshy masses separated by sulci.

Often harm is done in thus mistaking a part of the serotina for the adherent placenta. Continued effort is made to bring its surface on a plane with that of the uterus proper, but in so doing the serotina is torn away, cut, bruised, and lacerated, a traumatism is created because of the inability of the spoon to accurately differentiate. The faulty particle, situated a little higher than the instrument reaches, yet on a lower plane than the highest point of the serotina, perhaps because of its position, perhaps of its size, is not found by the spoon and removed. What takes place? A traumatism has been created; above it still clings a piece of placenta. If not removed what changes occur in this fragment? We hope expulsion or absorption, and not any metamorphosis which may be productive of harm.

A few weeks ago a gentleman mentioned a case of his, an abortion, remarking that he had already curetted (with instrument) twice, and now because of occasional hemorrhages was not sure that he had brought away all the adherent particles. He was about to curette again, and requested of me how I would ascertain the condition and how I would treat such a case. My reply was, to introduce the finger and explore, ascertain the true condition, and, if retention were present, remove with finger nail. "Why," he replied, "I am afraid I would not be able to differentiate the various tissues or recognize any secundines if present; therefore I use the curette."

Alas! he is not the only one of this opinion; yet his frankness is certainly pleasing and not without instruction.

Introduce the finger, and though at first you may not be able to distinguish the tissues individually, the difference in the consistency between the placenta and its membranes, and the ease with which they can be detached, are so apparent that these will soon assist in differentiating them from the uterine tissues. The harm that may be done by the intelligent digital curetting is so small, as compared with the blind instrumentation, that we are justified in ceasing to think of it as at all dangerous. In the one case you know what you are doing and have done; in the other you believe you know, but you know it is only a belief, as is shown particularly in the following case.

Some months ago I was called to attend a former patient, a widow, mother of five children, the eldest 18 years of age, the youngest 4 years of age. About a year ago she was again married. At the present time she was suffering from an incomplete abortion with many of its unfortunate consequences.

At the time I called patient was in a semi-conscious condition. Upon inquiry learned that the woman had been "treated" by a "lady physician" at her office.

A few days after, while at home, she was taken with severe pains and floodings. This woman physician was called, and during her attendance of some eighteen days had curetted (with instrument) the uterus several times. The patient developing peritonitis and rapidly growing worse, the family sent for me. Found the patient in bed, feet flexed and drawn up, skin pale, covered with profuse perspiration, anxious, pinched countenance, with marked meteorismus—a picture of septic peritonitis. From the vagina came a very offensive discharge.

After thorough cleansing of hand and irrigation of vagina, introduced the four fingers of the right hand into the vagina. After exploring the vagina, introduced the middle finger into the uterus. The uterus was markedly subinvoluted, very soft, and cervix patulous. Found the lower two-thirds of the uterus devoid of any adherent particles. In the upper third, anteriorly, found some pieces of adherent membrane, easily loosened and removed, but of no consequence. In the upper third, to the right posteriorly, came upon the serotina. Exploring it, found the lower portion of its surface free of adherent particles. There may have been some attached; if so, they had been removed. In the upper portion of the raised irregular circle marking the serotina, and sloping down toward the plane of the

vera, was attached a portion of the placenta, seemingly the size of a quarter. Here, then, was some placenta the spoon had not hit upon, though curetting had been repeated several times by the woman physician, who claimed considerable skill. Its removal by the finger was a very easy matter; it was softened, friable, dirty black, and with the intensely offensive odor characteristic of putrefying placental tissue. After removing all adherent particles, irrigated with a five-per-cent carbolic acid solution. Exploration of the pelvis showed an extensive inflammatory exudate into all pelvic cellular tissues, with parametritis and developing peritonitis, all of septic nature. Gave a fatal prognosis. The patient died the next morning. At the post-mortem I was able to verify the conditions presumed the evening before. The finding of the coroner's jury was "that no evidences of a criminal nature had been shown." Consequently the woman physician was discharged.

This case is of interest, since it again proves that it is not an easy matter at times to reach an adherent portion with the curette, and, where it is not reached, the danger from curetting the wrong part of the uterus and subsequent absorption is increased thereby. Since this is true, is not the lesson it teaches very plain?

Let me cite another case demonstrating the value of the introduction of the finger into the puerperal uterus.

A German woman in her fifth pregnancy went to a so-called midwife to procure "assistance." Patient claims that upon the payment of five dollars the midwife passed the sound. The same evening was taken with uterine pains, intermittent in character, accompanied by slight losses of blood. This condition continued through the following eight days, patient remaining about the house performing her usual duties during that time. Upon the ninth day, because of severe bearing-down pains, she took to her bed. Toward evening passed many clots and much blood. Could not distinguish the fetus or secundines. Becoming alarmed, the patient sent for another midwife, an intelligent woman, who, aware of the nature of the case, advised rest and administered hot douches. The next day, the hemorrhages persisting, patient sent for me.

As in all such cases, introduced my finger into the cavity of the uterus and found as follows: Uterus much enlarged and seemingly retroverted, cervix soft and easily passable. Entering

the uterine cavity, I soon became aware of the cause of the seeming retroversion. In the posterior wall of the uterus an intramural myoma, the size of a three months' old baby's fist, was easily outlined, causing a rounded projection anteriorly into the cavity. Upon the anterior wall the decidua serotina was found, with a piece of placenta still adherent about the size of a half-dollar. This was easily detached, together with some portions of membrane fixed above the site of the myoma, and the affair completed by irrigating with a carbolic douche. Administered ergot to encourage contractions, not because of the surfaces laid bare, but because of the presence of the myoma.

Here another illustration of the superior value of the finger is shown, it not only ascertaining without any doubt the presence and the site of the adherent mass, but demonstrating also a point of vital importance, the presence of the fibroid protuberance. And why? The diagnosis of adherent secundines being fixed, had I immediately introduced the instrument without first having explored the cavity with the finger, and commenced curetting, what would have been most probable? That my spoon would have first appreciated the tumor as formed by the inward projection of the myoma (unknown to me under those circumstances) and I would have believed it to be placental in nature, the myoma being covered by the soft decidua vera. Having been led to regard this as placental tissue, what then? I would continue the curetting until the surface of the uterus was again plane or until the true state of affairs had been ascertained. And what would the curetting have accomplished? The shaving down of the elevation as formed by the myoma, with serious consequences. Probably the placenta would be touched upon; if it were, it would be well; if not, suppuration and perhaps infection taking place, again observe that the danger of infective absorption would be increased, in the main due to the exposed and physiologically weakened condition of the lacerated and torn surface of the myoma, not to mention the dangers from that source itself, as secondary hemorrhages, etc.

In another case, where the abortion was caused by the woman herself, a physician curetted repeatedly, nevertheless the adherent placental fragments were omitted—septicemia. I signed the death certificate.

A VIIpara in third month "assisted" herself by passing a catheter. Again the same old story—incomplete abortion,

hemorrhages, etc. Embryo was recognized, but not the placental membrane. She called her physician, who, in the course of his treatment, curetted with instrument several times. Meanwhile inflammatory conditions developed. At about this time—two weeks after the abortion—her physician was called into the country. During the next few days her condition still growing worse, and her physician being yet absent, I was requested to attend.

I found the patient suffering from puerperal septicemia, septic peritonitis, the whole pelvis one mass of inflammatory action, with uterus firmly fixed. From the vagina came an intensely offensive discharge, so penetrating as to be immediately perceived upon stepping into the room. Irrigated and explored the uterine cavity with the finger, and discovered part of the placental membrane (as the placenta at this time seems one thickly developed membrane covering the entire internal surface of the uterus) attached high up in the fundus, in that part where the arch joins the posterior wall. This evidently had not been reached and detached by the curette, and was now in a putrefying state. With my finger I detached the fragment and then irrigated. Gave a fatal prognosis, because of extensive septic cellulitis, septic peritonitis, exhaustion from loss of blood, and general septicemia. The case lingered another week and died.

Rich material for instruction is not lacking in this case. A physician, supposed to possess ordinary skill, curettes the uterus on several different occasions, and yet misses the offending fragment whose removal was of such intense importance. Had the finger been introduced but once and careful exploration practised, the source of the difficulty would soon have been recognized and without trouble removed. Were it necessary to add to the force of the argument, I might readily do so by presenting many other similar instances. In the cases presented above I have directly compared the finger with the instrument, and believe that I have shown the superiority and the greater utility of the finger over the instrument. And so you will find should you adopt the plan. In all my cases of adherent secundines, whether they are doubtful or evident, I use the finger, and the finger only. In no case have I found it necessary as yet to call upon the instrument for assistance. And so well satisfied am I with the results thus obtained that I do not hesitate to recommend the practice in the warmest of terms. But

I would not have you understand me as advocating the indiscriminate introduction of the finger into the puerperal uterus. On the contrary, we should exercise much deliberation. In cases of doubt digital exploration is the only means we possess of removing the doubt, and we must never hesitate. I advocate the introduction of the finger only in those cases where the indications necessitate establishing a correct diagnosis or curetting.

The advantages of digital curetting are many.

The finger renders knowledge of the condition present accurate, reliable, and intelligent at every step, whether of exploration or operation. It is hardly necessary to state that this is not true of the instrument.

Digital curetting requires little assistance—for the curetting, none whatever, neither assistants nor instruments; consequently this saves the patient much suspense, discomfort, and pain. It is only when irrigating the uterus that instruments other than the uterine catheter are used, and then usually but the speculum, though this is not always necessary.

In instrumentation it is quite different; there the armamentarium and assistance are more or less elaborate, sometimes very elaborate, according to the operator and his ideas.

With the instrument alone we gain no knowledge of the anatomical conditions and relations of the uterus, whether they are normal or abnormal. To gain any information of value in instrumentation, first or last, the finger must be introduced; therefore if particles of secundines have to be removed, why not detach and remove at one and the same time?

Digitation shortens the operation, it is more effective, above all is decidedly less harmful, and beyond a doubt may be performed as aseptically as with the instrument.

Endometritis and metritis seldom occur after digital curetting. They are quite the rule after instrumental curetting.

In the introduction of the finger we act knowingly, not blindly, and do not cause traumatism, as the force used is only necessary to overcome the known resistance of the attached fragments. In instrumentation this knowledge is lacking.

Acting under the intelligent guidance of the finger in digital curetting, all of the adherent particles are recognized and removed; but with the instrument, blind in action, this result is not often obtained.

In instrumental curetting, if the cervix is not patulous, either digital or instrumental dilatation is resorted to, or curette gradually insinuated into and through the canal, but with danger of abrasions.

In digital dilatation, though the cervix be not sufficiently dilated, the tip of the finger is slowly insinuated into the canal as far as possible without too much violence. This causes reflexly a contraction, and the finger experiences a tightening or constriction proportionate to the strength of the contraction. Holding the finger thus fixed for a moment, without endeavoring to immediately advance further, it will be noticed that the constriction gradually yields as the uterus soon relaxes. Usually the finger can now be carried into the cavity with ease. It happens that the part known as Bandl's ring contracts as the finger approaches it, but after another moment's delay this will also yield, giving the finger ready access to the uterine cavity.

So much accomplished, how easy to finish the operation through loosening and removing the fragments, and without any further trouble or loss of time!

In instrumentation, after making your field by introducing your speculum into the vagina to fix the uterus and bring it into your field of operation, the volsella is hooked into the uterine lips and uterus brought down and so fixed. Unless wishing to precede this by an exploration of the cavity, now you are ready to proceed to introduce your instrument curette.

In digital curetting no instruments are necessary. The four fingers of the inferior hand, but not the thumb, are introduced into the vagina, the index finger being placed outside and in front of the anterior lip of the cervix in the vault of the vagina, the fourth and fifth fingers being placed outside and posterior to the posterior lip of the cervix in the vagina. These fix and guide the uterus between them as desired. The middle finger alone should be introduced into the uterine cavity, and with its tip particles are without difficulty or traumatism loosened and pushed out of the uterine cavity. The thumb is not introduced into the vagina, but is supported against the symphysis pubis.

The other hand is placed anteriorly upon the hypogastrium, making pressure upon and fixation of the fundus, as found necessary, by the middle finger.

With the finger we can palpate and outline every portion of

the entire internal surface of the uterus. Not so with the instrument. Here much difficulty is experienced toward the Fallopian tubes and above in the fundus; especially is this true after early abortions.

Digital curetting is not wholly without danger.

Excessive external pressure must be avoided, as the uterus may be so crowded down as to cause internal injuries. The same is true of instrumentation, if too great downward traction be made while bringing and holding the uterus in the field of operation.

Another point must be borne in mind when assisting externally with the hand, and that is, to avoid producing soreness in the hypogastrium by exercising too much pressure.

The same is true where a well-developed panniculus adiposus is present. Inflammation from too great pressure, with suppuration, may follow, but it usually confines itself to the adipose tissues and points externally.

TRANSACTIONS OF THE GYNECOLOGICAL SOCIETY OF CHICAGO.

Meeting of January 20th, 1893.

The President, DR. E. J. DOERING, *in the Chair*.

DR. FRANKLIN H. MARTIN presented a

CARCINOMATOUS UTERUS

removed from Mrs. F., age 31 years; puberty at 13; menstruation regular, lasting usually three days, some pain, so that she was obliged to remain in bed occasionally; married ten years, no children; one miscarriage six years ago; had some leucorrhea for a number of years. Within the last three months has been growing very weak. This symptom alone called the attention of Dr. Guthrie, of Bloomington, the family physician, and made him suspicious that cancer was the disease. He sent her to me, and before removing the uterus I obtained a specimen and had it examined by Dr. Evans, pathologist of the College of Physicians and Surgeons, who pronounced it carcinoma. But before the examination was made microscopically almost any one would pronounce it cancer from the macroscopic appearance.

There is one point this brings up which is not exactly in the line of presentation of specimens, but one that I would like to

see adopted by hysterectomists of this city for the protection of their patients and themselves. These women very often come to the city and go to a doctor, who diagnoses carcinoma. He will take the patient to a hospital, curette her, and send the specimen to a pathologist, who pronounces it carcinoma, and the doctor will set the day for operation and state his fee. The patient will by that time have consulted with all of her friends in the city, and is occasionally switched off to some other doctor, who receives the patient; although her case has been diagnosed by a well-known pathologist, perhaps, she has no certificate of that examination. I believe that when we have microscopic examinations made of specimens from the uterus, we ought to put them into the hands of a pathologist of known reputation, and he should give a certificate, and that certificate should be given to the patient, so that if she goes to another doctor she will have something to show, and not have to go through a second diagnostic operation. Besides, if the cancer is slight, at the second curetting it may not be found, and that, of course, reflects on the first physician.

This woman was operated upon two and a half weeks ago and has not had a bad symptom. One point in this case, as in many vaginal hysterectomies, was the fact that this woman after the operation had no symptoms of shock or indication that she had passed through a severe operation like abdominal section, proving, or at least hinting, that it is not necessarily the amount of tissue removed that produces the severe shock that we often see following laparatomies, but that it must be some other cause. That is, it is not the removal of tissue and a large amount of nerve distribution, but probably something in regard to the exposure of the contents of the abdomen when abdominal section is performed.

This specimen is a

FIBROID TUMOR

removed a week ago at the Woman's Hospital. Mrs. A., age 43; puberty at 12 years; has been irregular, flows six or eight days, pain so that she remains in bed occasionally; had a severe wetting, as she expresses it, when 13 years old, followed by a severe attack of abdominal inflammation; no children; three miscarriages at six weeks, the last fourteen years ago; has been ill nine years; first noticed an enlargement in the left side when ill with cellulitis, so-called, which disease she had three times. She had peritonitis once. Three years ago this patient was referred to me by the late Dr. Byford for electricity. At that time the tumor was somewhat smaller than it is at present, was firmly fixed in the pelvis and lower abdomen. I inquired very carefully into the history of what she called peritonitis, and I have every reason to believe, from her description of that illness, that

she really had attacks of localized peritonitis on two or three separate occasions. When I examined her I found the tumor was a large, subperitoneal mass rising apparently from the fundus of the uterus, and the operation proved this to be the case.

The uterus grew from the fundus, the tubes passing off below the tumor, the canal of the uterus having a depth of two and a half inches, so that it was not suitable for electricity—that is, with any idea of permanent or radical results. Dr. Byford was acquainted with my views on this subject at the time. She was in bed at the time and was very sick apparently; had not been up for several months. I began treatment by using a vaginal electrode of fifty to one hundred and fifty milampères. The electricity acted as a powerful tonic, and the woman got up and has been going about for several years, and was reasonably comfortable while she was taking electricity; but if she stopped the electricity for a month she was obliged to go to bed again. During all the time this treatment was going on the tumor grew, and at last she decided to have it removed, especially as I found the tumor had become much more movable, there were fewer attachments, and I could promise good results. The tumor was removed a week ago and the patient had no bad symptoms. In this operation I began with the idea of putting the stump in the vagina according to the Byford method. Not realizing, however, that so much of the uterus was below the tumor, I got my rubber tube on too high, and when I was ready to invert the stump into the vagina I found that it was two and a half instead of one and a half inches in length, thereby preventing vaginal fixation without further shortening. Fortunately the length of the stump made it easy to fix in the lower angle of the wound, and the case was treated in that way. This case is another illustration of the fact that large, subperitoneal fibroids cannot be treated successfully by electricity.

Dr. J. H. Etheridge.—Why would not that have been a good case for enucleation? You would have had a good field for taking care of your capsule, turning it over and sewing it in, and bringing it into the peritoneum.

Dr. J. A. Lyons.—I would like to emphasize the remark of Dr. Martin in regard to giving a certificate to each of these cases having malignant disease. I have seen a great many cases where half an inch has been taken off from the cervix, causing a great deal of pain and trouble to the patient; and many others where repeated curetting has been done without any apparent good resulting therefrom, either to the patient who suffered, or to the doctor who spent time, money, and patience, which are always required to make proper sections of these clippings or curettings, besides the diligent searching to make a proper diagnosis from the sections microscopically. Had a certificate been given some good might have been done, at least to the patient. I think the point well made.

DR. FRANKLIN H. MARTIN.—I expect enucleation could have been performed in this case, but I should not advise the operation in any case where it was possible to remove the uterus. It is not considered good surgery to leave a large fibro-myomatous or muscular stump to bleed (which it almost invariably does) in the abdominal cavity. The enormous mortality from the enucleation of fibroids is, I believe, recognized to be caused by the great amount of hemorrhage that is likely to follow the operation. Enucleation in a woman 43 years of age could have had no advantages for the patient over extirpation, even if such a procedure had preserved the appendages, and it would have possessed the great danger of submitting the woman to an obsolete and unsurgical operation.

DR. FRED BYRON ROBINSON presented specimens of

TUBO-OVARIAN ABSCESS AND PARTIALLY RECOVERED PYOSALPINX.

These specimens were given to me for examination by Dr. Franklin H. Martin. One represents a tubo-ovarian abscess. The pus could be squeezed from the tube into the ovary, and from the ovary into the tube, so that there was a direct passage from ovary to tube. The mucous membrane was almost wholly destroyed. The tubal plicæ were flattened out, and the whole mucous membrane had lost its velvety, luxuriant, normal appearance. The few remaining projecting plicæ were swollen, edematous, friable, and the villi showed a clubbed appearance at the end. At the fimbriated end, out of which proceeded the infection process into the ovary, one could easily see that the fimbriæ had not collected together and closed in the usual way, but had been caught in the inflammatory process while grasping the ovary, as one's hand grasps a ball. Hence the fimbriæ in this specimen were mainly fixed over the ovary like a funnel. The usual way is that during the closure of the fimbriated end of the tube the peritoneum gradually contracts, and the fimbriæ will often be found neatly folded like the petals of a flower, while it is really the peritoneum that closes the tubal end. The whole process of such ostial closure may be noted in a number of cases, for one can find a few straggling fimbriæ which were caught in the process of tubal closure and left out of the neatly folded ones. The muscular wall of the tube was very thick with hard, white connective tissue. The thickest, and hence the oldest, was in the isthmus. The peritoneum covering the tube was thickened and covered with some old inflammatory products. The ovary was simply a meshwork of connected pus cysts—dilated Graafian follicles—which contained about a tablespoonful and a half of thick, jelly-like pus of a yellow color. It was three and one-half inches long and two inches thick, and had developed between the broad ligament until it had stolen away all of the mesosalpinx, so that the tube simply lay stretching itself

circularly around the ovary, between it and the peritoneum. The cause of the disease in this specimen is some slow, progressive infective process.

The other tube and ovary represent another stage of the same process—*i.e.*, the same slow but continuously progressive infection. The tube shows a partially recovered pyosalpinx. Nothing but dried débris was found in the tubal lumen. Curiously enough, the fimbriated end of the tube was entirely free from the free ovary. The fimbriated end of the tube was in this case entirely closed by peritoneal adhesions, while the fimbriæ lay folded up inside the tubal lumen. The mucous membrane of the tube, like its fellow, was almost wholly destroyed down to the solid, hard, white connective tissue. This connective tissue was one-quarter of an inch thick at the isthmus. The peritoneum covering the tube was thickened and covered with the flaky, shreddy lymph, the product of a recent perisalpingitis. Three thin pedicled hydatids of Morgagni hung from its fimbriated end. This tube, I think, shows that a pyosalpinx may recover, and that it is the real forerunner of a hydrosalpinx. The pus is absorbed or becomes inspissated, and the tubal mucous membrane is left in a catarrhal condition to secrete fluids. The ovary was found cystically degenerated and its cysts filled with a white, friable, cheesy material. After this cheesy matter was scooped out of its beds, one could observe the Graafian follicles, about the size of large peas, strung all around the circumference of the ovary, just under the germinal epithelium, like sections of solid spheres lying on the ovary. This shows that the infection came from the tubes. Now, when the gonococcus arrives at the ovary by way of the tube, it attacks the germinal epithelium and then advances to other epithelium (glandular), which it quickly finds in the membrana granulosa, which is both cylindrical and glandular. Hence infectious processes distend the Graafian follicles and cystically degenerate the ovary. I know of no other infectious process than gonorrhea that will cause such continuous, progressive, and profoundly extensive disease in the tubes. It is destructive from beginning to end. Gonorrhea is the only progressive, infectious, continual process in the mucous canal of the female genitals. The gonorrheal process stops when it meets the peritoneum, because it does not thrive on the epithelium of the peritoneum, and also because its presence so irritates the peritoneum that it effectually checks its further progress by extensive barriers of exudate. Such tubes and ovaries should always be removed, as they are worse than useless, continually menacing the life of the woman and keeping up her suffering.

Dr. Robinson also presented a specimen which illustrated

SPIRALLY TWISTED, ANGULAR TUBES.

Such women are frequently afflicted with premenstrual pain

and sterility. Dr. Reuben Peterson, of Grand Rapids, Mich., sent me a tube and ovary removed from a girl who was ill thirteen months. She had pain in suprapubic region, right groin, and thigh. The ovary was prolapsed and the broad ligament deeply congested. She was incapacitated for work. The tube presented a convoluted, contorted condition. It had short, spiral, angular bendings, and the peritoneum covering the tube did not dip down into the tubal depressions, but simply stretched from one spiral angle to the other. The uterine end of the tube resembled a corkscrew in its course; some of the angles were very sharp and often partially occluded its lumen. The perisalpinx was quite normal. The muscular wall was irregular in its thickness, as the lumen showed irregular sacculation. At the kinks of the spiral contortions the tubal lumen was contracted, and the tubal lumen between the angles was dilated, so that the tube really presented strictures and dilatations, therefore the muscular wall was irregular in its thickness. It appeared that the tubal wall showed at its constrictions connective-tissue thickening, as if it were of inflammatory origin. To the naked eye the tubal mucous membrane was normal. Three years ago I presented some views that such spirally contorted and angularly twisted tubes were of two kinds. One kind of spirally twisted tube was simply congenital, as the tube in all animals which I have examined (horse, pig, dog, sheep, and man) are spirally coiled up in the fetus. The second kind of spirally twisted tube is of acquired origin. It is simply subinvolution of the longitudinal muscular layers of the tube. The circular muscles of the tube do not hypertrophy so much, and therefore cannot have so much subinvolution and distortion. The spirally contorted tube is the tube pre-eminently of premenstrual pain. It has difficulty in driving the fluid around the angles and through the partial strictures, and in this manner repeated monthly tubal peristalsis dilates more and more the sacculations lying between the angular contortions. Such women never recover from the premenstrual pain or tubal colic, except by removal or menopause. They generally get worse, as the tubal obstruction irritates the automatic menstrual ganglia at the site of the constriction and aggravates the trouble. Also, each repeated menstruation multiplies the reflexes which pass to the abdominal brain, and, being reorganized there, flash off to every viscus, destroying its rhythm. Hence follow in logical sequence the following pathological stages:

1. Irritation, which starts in the tubes.
2. Indigestion, which originates from disturbed visceral rhythm.
3. Malnutrition soon follows continued indigestion.
4. Anemia logically follows malnutrition.
5. Neuroses follow the anemia.

A very interesting point in this specimen is the secondary

infection or disease which the tube conducted to the ovary and broad ligament. The ovary is cystically degenerated. The infection also penetrated one of Kobelt's tubes, and a cyst was formed. It is a broad-ligament cyst, I know, because it can be enucleated entire from the broad ligament without tearing the peritoneum. Cysts in the parovarium exist in over sixty per cent of specimens which I have examined. It is a curious matter to observe that it requires so long for the ovary to become cystically degenerated from infection from the tube. A whole year (or maybe two) will occasionally elapse before the ovarian cystic degeneration progresses very far. It may be on account of the loss of vitality of the infection—it may be attenuated. I wish to add here that one can easily observe that girls who start with painful menstruation and continue a few years with painful menstruation are sterile in a large majority of cases. I offer the following explanation: When a girl has much premenstrual pain she has often a spirally convoluted, contorted tube. It has short, angular bends in it. Now, these bends, angles, and contortions obstruct the transmission of an ovum. When the automatic menstrual ganglia are at the maximum of activity the tubal mucous membrane secretes the lumen of the tube full of fluid. The fluid in the tube is solely for the purpose of floating an egg down to the uterus. The cilia, by their action toward the uterus, keep up a fluid current, and so the egg *floats* into the uterus. Now, if angles, kinks, bends, and contortions occur in a tube they will tend to obstruct the passage. The monthly tubal peristalsis causes the stricture to become worse.

Dr. J. A. Lyons presented a specimen of

MAMMARY CARCINOMA,

interesting because of the rapidity of its growth. About four months ago the patient asked me to look at her breast, which was giving her some pain. I discovered a very small tumor, probably the size of a hazelnut. Three weeks ago she came to my office, and the tumor then measured four and a half inches in its long diameter, and at its base three and a half inches. Fourteen days ago I removed the breast with the auxiliary glands with good results, union being primary.

Also,

A FIBROID OF A UTERUS

removed by Dr. A. L. Cory, of this city, and in which I assisted three days ago, and it is presented because of the peculiar history of that patient. This woman had had twelve children and five miscarriages. Before the birth of her last child, which she carried to full term, one of our gynecologists diagnosed a tumor which he thought was ovarian in character; but, as she was then pregnant, he did not feel like doing anything in the matter.

At the birth of the child she had very severe pain, so severe that the doctor in attendance thought there must be surely something wrong, and she told him of this diagnosis of a tumor; but he thought there was probably nothing but the child, or, as he put it, the physiological tumor. It has proven, however, that the gynecologist was correct in his diagnosis of a tumor, although mistaken in its character, which was a fibroid in the left horn of the uterus. I will state that in operating the doctor expected to remove a dermoid cyst, but, finding this uterine fibroid, he did an abdominal hysterectomy. The operation was done neatly, and the pedicle turned into the vagina, as advised by Dr. Byford. The patient is doing well, except that she has vomited incessantly, but there is no elevation of temperature. About two hours after the operation the temperature rose to 100°, but has since been normal.[1]

Dr. Fred Byron Robinson presented a

DRAINAGE TUBE MADE OF ALUMINUM.

It was light, not in danger of being broken like glass, and very durable.

Dr. Robinson also read a paper on

THE ABDOMINAL BRAIN IN GYNECOLOGY.[2]

Dr. Joseph B. Bacon.—I have listened to Dr. Robinson's explanation of the sympathetic nervous system and its reflexes with much interest. And from ideas expressed by him to-night I am inclined to think many of the disturbances of the uterus may be due to motor reflexes, as shown by muscular spasm, notably the flexures of the uterus. I think a great number of uterine flexures may be due to reflex disturbances originating from diseases in the rectum. We find this condition of the uterus very frequently in young females who have no other disease of the genitals; not a pathological condition can be found in any of the pelvic organs except the flexure and the rectal disease. This class of cases almost always has a history of chronic constipation, impaction of feces, hemorrhoids, proctitis, or some form of rectal disease sufficient to cause reflex disturbances.

Cripps, in explaining the part the levator ani muscle plays in forming the worst form of rectal stricture, has stated as a pathological fact that when a nerve of a muscle is irritated for an undue time, that muscle takes on a chronic spasm and its fibres

[1] I saw the patient with Dr. Cory on the tenth day, and he reported vomiting had stopped on the third night, after the administration of ten grains of calomel. Temperature has since remained between normal and 100°. Not one bad symptom has occurred. Stitches removed on eighth day, and wound united. Has had a quarter of a grain of morphine three times since the operation—once before coming out of ether, the second to stop drastic action of the calomel, and the third time for nervousness, not pain.

[2] See original article, p. 93.

undergo a fibrous degeneration with permanent contraction. This law always holds good with true spinal nerves. Why may it not act with the motor part of the sympathetic?

The rectum is principally supplied by sympathetic nerves. A chronic irritation of these would be transmitted through the hypogastric plexus to the abdominal brain, there reorganized, and most likely be sent out where there is least resistance; the numerous nerves running from this centre to the uterus afford the channels of least resistance, and the whole force of the reflex may be expended upon one set of muscles, causing a chronic spasm, final fibrinous degeneration and contraction—the conditions always present in chronic uterine flexures.

Fox states that a vaso-motor spasm of the blood vessels may be reflexly produced and the spasm indefinitely maintained. This fact would explain how a reflex originating in the rectum, sent to the abdominal brain, there reorganized and sent out to the blood vessels of the uterus, causing a vaso-motor constriction, might, if long continued, produce trophic disturbances in one set of muscles, allowing the opposing to cause the flexure. I think, at least, that the gynecologists should make careful rectal examinations in all those cases where flexure of the uterus is present and no cause is found in the sexual organs.

Dr. H. B. Stehman read

AN ABRIDGED REPORT OF NINETEEN SUCCESSIVE CASES O F ABDOMINAL SECTION.

Case I.—Single, ballet girl, æt. 33. *History.*—Well-authenticated history of repeated attacks of vaginitis. Three distinct seizures of pelvic peritonitis, lasting from two weeks to several months. Very hysterical, and even maniacal at times. In these fits of intense excitement she would moan, cry, laugh, strike her head against the bed, tear off her clothing, roll over on the floor from the bed, and remain all night under the bed, if allowed, making violent objection to any effort to replace her in bed. These attacks would last for weeks, during which time she refrained from taking food, remaining for the greater part of the time, especially at night, in a semi-unconscious state.

Pressure over the lower part of the abdomen caused intense pain, vagina very sensitive and painful, uterus anchylosed. In fact, all the pelvic viscera seemed buried beneath an extensive exudate. Bladder very irritable, vesical tenesmus being her most distressing symptom.

Operation.—Extirpation of ovaries and tubes, which were embedded beneath large and extensive adhesions. The exudate was so extensive that the relation of the parts was scarcely recognizable. The adhesions bled very freely. The tubes and ovaries were matted together so that it was even difficult, after their removal, to identify the one from the other without care-

ful dissection. The tubes contained an abundance of thick, purulent fluid; the walls were thickened and the calibre greatly increased. She suffered no serious shock from the operation, and her convalescence was uneventful. It was interesting to note, however, that as soon as the immediate effects of the operation were over she began to manifest interest in things about her, the childish symptoms gradually wore away, the mania never returned, so that ultimately she entirely recovered and has remained well.

Case II.—Married, three children, æt. 28. *History.*—Complained of pain in left side of pelvis, with darting pains shooting down the left leg; has existed for three months. Suffers much from dizziness. Per vaginam a fluctuating cyst can be felt in the cul-de-sac a little to the left of the median line. Uterus freely movable, but somewhat enlarged. Menstruation absent for six weeks.

Operation.—Removal of cyst of left ovary, which was entirely free from adhesions and about the size of a fetal head. Fundus of uterus enlarged, soft, and boggy. Right ovary sound. No appreciable disturbance from the operation. Patient made a rapid recovery and went home in less than three weeks. Seven and one-half months later she gave birth to a child.

Case III.—Widow, seamstress, æt. 49; had two children. *History.*—Has complained for years of a dragging pelvic distress and weight, with a worrying rectal tenderness that seems never to be absent. Fairly nourished, general health medium, and extremely nervous. Has had operation for lacerated cervix and perineum, with dilatation of anal sphincter, with no relief. The weight and dragging, bearing-down feeling in the rectum still continue.

Upon examination found a fluctuating tumor, size of a goose egg, in cul-de-sac, somewhat to the left, pressing upon the rectum. Extremely painful, especially if examined per rectum, the slightest touch producing sharp, intense, lancinating pain.

Operation.—Ovariotomy. The tumor was a simple cyst of the left ovary, with a thick wall, and not adherent. Removal without rupture. No shock from operation. Convalescence uneventful. After the immediate effects of the operation the patient was entirely relieved from pain and tenesmus, her general health gradually improved, and with it came relief from her nervous symptoms.

Case IV.—Single, servant, æt. 23. *History.*—Six months previous had acute vaginitis. Dating from this attack she commenced having severe pain in the left side, low down in the pelvis, which was greatly aggravated upon standing or walking, and relieved by flexing the leg while in the recumbent position. The vaginitis was treated by astringents; fomentations were applied for weeks externally, with hot douches by vagina, relief

being only palliative. Obliged to remain constantly in bed. Examination showed a fluctuating tube on the left side, distended to the size of a hen's egg, tender to the touch; right side normal.

Operation.—Removal of left ovary and tube, which were bound down by numerous soft adhesions. The tube was greatly distended, containing a clear fluid, walls thin, lining membrane thickened and rough. Ovary cystic and contained small hematoma. No shock from operation; easy recovery. Convalescence gradual and tedious; patient able to work in two months.

Case V.—Widow, æt. 35, one child. *History.*—Suffered from pelvic troubles for nine years. Easily fatigued; standing, walking, or lifting produces sickening pelvic pain. Tenderness on both sides, and external pressure over lower part of abdomen causes soreness and distress. Tilting the cervix from side to side causes pain upon the side of tension; moving upward or forward and backward produces pain simultaneously on both sides. Pressure, even slight, upon either broad ligament, but especially the right, drives patient almost into paroxysms. Thickened masses felt on either side of the uterus along the tubes. Uterus partially fixed. Has had local treatment with slight intermission during past nine years, with but temporary and passing relief. One month previous to operation she received a daily vaginal douche for one hour after the following method: She was placed astride the bed, on a Kelly ring, and an Etheridge fenestrated speculum, to inner surface of lower blade of which was secured a douche point admitting of an exceeding fine stream, was introduced into the vagina and secured by distending it with as large a quantity of absorbent cotton as the patient could tolerate. The irrigating tube was attached to a rubber hose of a douche pail placed on the table by the bedside. The water was much hotter than a hand could bear, though not distressing to the patient. The result of this treatment was to relieve pelvic soreness and acute pain, localizing the trouble to the respective tubes, which were also greatly relieved; but the patient, fearing a relapse upon the slightest exposure to cold, desired a radical cure. In favor of the above method of irrigating, the following are some of the advantages:

Only a small quantity of water is needed; it can be used much better than by the usual way; the heat is applied to a larger surface; the pressure is beneficial; after introducing the speculum, packing the vagina, and starting the stream, the patient requires no attention except an occasional supply of hot water. If the tampons have strings attached, any one can remove the speculum, etc.

Operation.—Double oöphorectomy. The right ovary was prolapsed and encysted, buried beneath adhesions which, in consequence of the local douche, were quite friable; tube distended. Left ovary shrivelled; tube enlarged, covered with plastic exu-

date. They contained a glairy mucus, the lining membrane velvety and granular, bearing the marks of a chronic catarrhal inflammation. The omentum was adherent to the fundus uteri, causing quite an elevation at this point, which, six months previous, was diagnosed to be a subserous fibroid. Patient rallied from operation very well. After-treatment as usual, convalescence gradual. Patient has wholly recovered, being entirely free from ache or pain, with her former vigor restored.

Case VI.—Married, æt. 35, never pregnant. *History.*—Intense ovarian neuralgia, with dysmenorrhea, for five years. Circulation feeble, coldness of extremities, general health much impaired. Headache, epigastric pain, constipation. Local treatment persisted in for the greater part of the time, with only partial results; upon the omission of the treatment, symptoms returned. Both ovaries are enlarged and painful, more especially the left, which is prolapsed.

Operation.—Double oöphorectomy. Ovaries cystic, left prolapsed and covered with friable adhesions. She rallied from the operation without any special symptoms out of the usual, convalescing rapidly, making an excellent recovery, gaining in strength, and free from nervous symptoms.

Case VII. *History.*—Married, æt. 30, had three children; miscarriage three years ago, since which time she has never been free from pain in left side. General health much impaired; easily fatigued, irritable, and very nervous. In right iliac region one can feel a fluctuating tumor size of a fetal head; same can be felt very distinctly per vaginam. On the left side the tube can be traced, which seems much distended and quite tense, faint fluctuation.

Operation.—Broad-ligament cyst on the right side extensively adherent on its free surface, and hydrosalpinx on the left, with chronic inflammatory adhesions covering intestines and peritoneum. Enucleation of cyst, with ligation of the ligamentous walls. Removal of left tube and ovary, which was buried beneath a mass of adherent intestines. Patient suffered little shock, making an uninterrupted convalescence, free from pain, and entirely well by the end of five weeks.

Case VIII. *History.*—Married, æt. 32, two children. Acute attack of pelvic peritonitis following exposure during menstruation six months previous. Symptoms of localized peritonitis, tenderness, pain on pressure or upon motion, pulse increased, with rise of temperature, etc. Local treatment for five months, with partial improvement; for one month after admission to the hospital the above-described douche was continued, with further relief of the acute symptoms. Upon examination the uterus was found fixed, with a mass of exudate covering its adnexa. The tubes were outlined as greatly distended; ovaries could not be felt.

Operation.—Removal of both tubes and ovaries. Upon open-

ing the abdominal cavity the relation of the respective parts was found to be masked by extensive, firm adhesions, which by their general attachment covered the pelvic viscera. These were broken up and the tubes and ovaries removed. The hemorrhage, though at first significant, ceased after ligation of the ovarian vessels. Though considerable surface of the pelvic brim and floor was disturbed in breaking up adhesions, the patient suffered little shock and made a gratifying convalescence. She rapidly regained her usual strength and vigor, and is now perfectly well.

Case IX. *History.*—Widow, no children, æt. 55. One year previous noticed tumor in left iliac space, which grew rapidly larger and then discharged serous fluid into the vagina; the discharge continued for months, the aperture closed spontaneously, and the abdominal cavity was filled with ascitic fluid. Both externally and per vaginam a nodular mass could be outlined in the region of left ovary. By digital touch a fluctuating cyst was likewise recognizable on the same side, pressing well into the vagina. Patient emaciated, failure of general health gradual, easily exhausted, inability to rest in recumbent position, dyspnea.

Operation.—Exploratory laparatomy. The abdomen filled with ascites, cyst of broad ligament size of an orange, carcinoma of ovary with nodules scattered throughout the abdominal cavity. Wound closed, abdomen undisturbed. Patient was much more comfortable after pressure symptoms were relieved, and was up in two weeks. About ten days later she began to show cerebral disturbance, which in a short time was followed by profound coma (cholemia) and lasted for several days previous to death. No albuminuria.

Case X. *History.*—Single, æt. 25. Always suffered from dysmenorrhea more or less, but more especially during the past five years. During this same period she noticed that she was gradually growing more nervous; at times she was unable to control herself, giving way to violent hysterical paroxysms, at other times swooning away and remaining so for periods varying from a few hours to several weeks. Sometimes the attacks came rapidly in succession; at other times she would be comparatively free for a week or two, but was sure to have them during the premenstrual week. At the time of her protracted spells, while she responded at intervals to any question or request, nevertheless the time was a perfect blank to her.

During these years she received local treatment by tampons, douches, dilatation of cervix with curetting, with internal administration of antispasmodics, tonics, etc., but with only temporary relief, to be followed by a succession of more violent attacks. The uterus was quite oval, the left ovary was prolapsed and excessively tender, the right one perched on the ligament and enlarged.

Operation.—Double oöphorectomy. Both ovaries had under-

gone extensive cystic degeneration. Convalescence rapid. By the end of the first week it was evident that her mental condition, which previously had been dull and lethargic, was becoming much brighter, and she herself expressed the same idea in the following words, "I feel that a great weight has been taken from me," and in a recent letter she writes, "I am feeling just splendid."

Case XI. *History.*—Married five years, never pregnant. For several years has suffered severe pains in right side, in region of ovary and tube, pain starting down the leg, so severe as to confine her to bed for much of the time. Tube much thickened; ovary nearly the size of an egg.

Operation.—Removal of right tube and ovary. The fimbriæ were agglutinated; the tube thickened and filled with a light, glairy fluid; the ovary contained a cyst the size of a pigeon's egg, and was bound down by extensive adhesions. Convalescence was uninterrupted, the operation relieved her of the source of her pain, and our only trouble was to restrain her from overexertion.

Case XII. *History.*—Married, æt. 41, two children. Always enjoyed good health until three years ago. Menstruation preceded by mental forebodings, great pelvic distress, violent intrauterine pain, with tearing and drawing sensations extending to both ovaries. Mental disturbances becoming more pronounced; both the patient and her friends are quite distressed about it. Uterus much enlarged and tender, ovaries very sensitive upon pressure. Has had local treatment for several years.

Operation —Double oöphorectomy. Both ovaries cystic and bound down by soft, friable, plastic adhesions. During convalescence her mental disturbances rapidly disappeared, so that by the time she was able to be about they had entirely left her. In following up the case I find that there has been no return; patient bright and hopeful.

Case XIII. *History.*—Married, æt. 43, two children. Has been failing in health during past year. Principal symptom is abdominal soreness. Has lost some flesh, but still has an abundance of fat. Waist measurement fifty-three inches. Encysted mass distinctly outlined on right side of abdomen, in addition to free fluid in abdomen. Nodular mass felt, covering left broad ligament and ovary.

Operation.—Exploratory laparatomy. The omentum was entirely covered with cancerous nodules, which involved the greater portion of the peritoneum with the uterine appendages. The encysted mass on the right side was the result of the attachment of the omentum to the parietal peritoneum in such a manner as to form a closed sac. The abdominal cavity was washed out with sterilized water and the wound closed. The walls were fully four inches in thickness. The operation gave her immediate relief from pressure symptoms, and while under our care

she was free from acute abdominal pain, though of course this benefit was only temporary.

CASE XIV. *History.*—Married, æt. 28, two children. Practically a confirmed invalid in consequence of persistent ovarian neuralgia which has existed for several years. In bed three-fourths of her time, and when up can scarcely walk. Her mother is and has been in a similar condition for years. Patient has had the benefit of local treatment for two years or more. Both ovaries are much enlarged and exquisitely tender upon pressure.

Operation.—Double oöphorectomy. Ovaries cystic, covered with general adhesions.

Convalescence uneventful; marked improvement both mentally and physically within a few weeks.

CASE XV. *History.*—Married, æt. 47, no children. Has had typhoid fever, acute articular rheumatism, pneumonia, and, ten months ago, the influenza. Since her last illness her health has been only fair; easily fatigued; abdominal tenderness, especially in the umbilical region. She began menstruation at 14, has never been pregnant, and suffered little or nothing of uterine trouble until five years ago, when the tumor first appeared. Since having la grippe all the uterine symptoms have been exaggerated—pain in walking, excruciating pain upon making a misstep, obstinate constipation, and heavy, dragging pelvic distress. Menorrhagia almost continual, which was greatly increased on the slightest exercise. Examination: Globular tumor to the left of the median line, extending above the umbilicus; palpation revealed distinct pulsation both externally and per vaginam, and on auscultation a pronounced bruit was distinctly heard.

The mass was fixed, filling entire pelvic cavity; uterine canal normal in length, but diverted very markedly to left side. Bowels constipated. Pulse 90 to 100, temperature 99° to 101.5°, the evening rise being about one degree.

Operation.—Upon opening the abdomen the tumor was found universally adherent; spread over the omentum, intestines, parietal peritoneum, broad ligaments, and tubes were numerous miliary deposits, with secondary inflammatory bands of adhesions. Upon reflecting the attached omentum and intestines the tumor was fully exposed. In addition to the uterine wall the capsule contained large veins in luxurious abundance, the varicosity extending to the broad ligaments on the same side. The left tube was greatly distended and shared in the inflammatory process; this with the ovary was removed. The right broad ligament with its tube and ovary, owing to the distended and anchylosed condition of the uterus, was buried out of sight and was left undisturbed.

After removing the fibroid the sac bled profusely; the hemorrhage could only be controlled by an elastic ligature

firmly encircling the mass, which was secured by two of Tait's pins. The parietal peritoneum was attached to the peritoneum of the sac, and the latter was anchored to the abdominal wall by an inferior and superior suture. The stump measured three and one-half inches in diameter and was dressed with iodoform and tannic acid. Drainage by a Mikulicz. Patient put to bed with pulse of 112, which reached 148 at 10 P.M.; highest temperature, 8 P.M., 101.4° per rectum. During first forty-eight hours pulse remained at 140 and temperature did not exceed 99°. Within first twenty-four hours she complained of intense thirst, which was indeed the most distressing symptom. She received whiskey and digitalis by mouth and strychnia hypodermically. The beginning of the second day she suffered considerably from eructations of gas, though complained of nothing more serious.

There being very little drainage, the gauze was removed at the end of forty-eight hours and the abdomen closed by a temporary suture.

The exsiccated stump was trimmed to the soft parts, and again dressed with iodoform and tannic acid. On the fourth and sixth days the local treatment was repeated, and by this time the mass above the pins was entirely removed, so that the latter could be simply lifted off, allowing the stump to retract.

After this the stump was dressed daily with peroxide of hydrogen, followed with either boric acid or iodoform. By the tenth day the rubber tube came away. On the fourteenth day I removed the catgut suture which secured the peritoneal surfaces, and also the upper and lower anchor sutures. The latter were of silk, but the former was chromicized previous to use and was as firm as when first introduced.

The necrotic tissue was then removed as freely as possible, and the surface treated daily with a solution of pepsin and hydrochloric acid.

By the twenty-fourth day the entire pedicle was removed. The base of the wound, which was of uterine tissue, and the sides, presented a healthy granulating surface. The ligatures applied to left broad ligament were also removed.

The patient was anesthetized and silver sutures were used to approximate the abdominal wall, care being taken to bring the surfaces easily together, allowing space for drainage, especially at the lower edge of the wound. After this secondary procedure the wound was treated with balsam of Peru and closed very rapidly. The advantages of this secondary suturing are twofold: the abdominal opening is closed very much more rapidly, but of still greater importance is the fact that the cicatrix is made much stronger and the possibility of ventral hernia very much lessened.

It was noticeable that as the case progressed the abdominal symptoms gradually subsided. The temperature varied from

99.5° to 101°, but this too showed evidence of defervescence, so that by the sixth week the temperature had reached the normal point and remained so. It is also interesting to note that the symptom of thirst, which at first was so distressing, though gradually subsiding, did not entirely disappear until the temperature reached and remained normal.

As soon as she had recovered sufficiently from the effects of the operation she was given guaiacol dissolved in alcohol, to which was added the syrup of hypophosphite of iron. This combination, in cases where antitubercular treatment is indicated, has given me most gratifying results.

Intestinal disturbances were treated with an occasional mercurial cathartic followed by antiseptics. Her condition after the operation is expressed in a letter written the day before Thanksgiving, in which she says, "I am in perfect health, without an ache or a pain." The source of her tubercular infection was undoubtedly through the tubes, as in the contents of the one removed Dr. Slaymaker found tubercular bacilli.

CASE XVI. *History.*—Married, æt. 41, several children; confirmed invalid for three years. General pelvic pains, more especially in right ovary, which was much enlarged; uterus hypertrophied; rectum tender from pressure.

Operation.—Double oöphorectomy; right ovary cystic, with myoma of uterus. Left broad ligament was removed to cut off uterine nutrition.

Surgically her convalescence was all that could be asked for. The pelvic distress was to a great degree relieved, but the habits of three years' invalidism were so pronounced that rapid progress could hardly be expected.

CASE XVII. *History.*—Married three years, æt. 23, never pregnant. Since her marriage has had three distinct attacks of peritonitis and history of acute vaginitis. Fifteen months ago had pelvic abscess on left side, which was evacuated per vaginam. Relief for three months, pain throughout pelvis as previously. Fluctuating tumor, size of an orange, distinctly felt on same side. When the bladder was distended a marked prominence could be seen and felt at the right of the median line. Patient confined to bed. Temperature ranged 1½° above normal. General condition only fair.

Operation.—Removal of ovarian tumor from the left side, and ovary with much-dilated pus tube on the right side. Intestines agglutinated by plastic inflammation, obscuring pelvic viscera from view. It was only by breaking up the intestinal adhesions that the viscera could be reached. One loop of small intestine was firmly fixed between the uterus and bladder, adherent upon its under surface and sides throughout, and only by its reflection could the cyst of the left ovary be exposed. The right tube and ovary were reached with less difficulty. The patient suffered serious shock, but after forty-eight hours pro-

gressed very nicely. At the end of the third week there was a slight rise of temperature, with rèdness and pain in lower angle of abdominal wound. Three days later a small quantity of pus escaped, with a few bubbles of gas. The discharge is growing less and the gas less frequent. Fecal matter does not escape from the fistula. There still remains general peritoneal soreness, resulting, no doubt, from the chronic peritonitis, and this more than the fistula keeps the patient from progressing more rapidly.

Case XVIII. *History.*—Not married, æt. 28. Dysmenorrhea of eleven years' standing, ovarian neuralgia, anemic, emaciated, prolapsed uterus, tender cervix, bedridden for the most part, quite hysterical.

Operation.—Double oöphorectomy; ventrofixation of uterus. Convalescence usual, patient quite encouraged. Mental condition much improved, with absence of hysteria.

Case XIX. *History.*—Married, æt. 25, one child, one miscarriage. Had fall six years ago. Tender left ovary ever since. Pain in ovary remained almost during the entire pregnancy. At times it became so severe that it was impossible for her to walk. For the past two years she has been confined to bed almost constantly. Circulation poor, feet and hands clammy and cold, with excessive perspiration. Left ovary enlarged and prolapsed; right ovary size of a small egg and fluctuates. Local treatment received a fair trial, with partial relief.

Operation.—Removal of both tubes and ovaries. The left ovary was filled with numerous small cysts; the right contained a cyst holding about one and a half drachms of fluid. The patient suffered greatly from constipation, and so, after the abdominal toilet was finished, the sphincter ani was dilated, which we found quite helpful in relieving the distress from gas which is so annoying to patients under similar conditions.

Convalescence goes on well. The patient is brighter and cheerful and entirely free from the original pain.

Meeting of February 17th, 1893.

The President, Dr. E. J. Doering, *in the Chair.*

Dr. Frank A. Stahl read a paper on

DIGITAL CURETTING OF THE PUERPERAL UTERUS.[1]

Dr. T. J. Watkins.—In my experience it has been impossible, in many cases, to thoroughly curette the uterus with the finger without the introduction of the whole hand into the vagina. Indeed, I now seldom perform digital curettement without introducing my whole hand into the vagina. I believe it

[1] See original article, p. 110.

impossible to ascertain the real condition of the cavity of the puerperal uterus without digital exploration. This, however, should not be done unless definite indications exist. To corroborate this statement cases might be reported of the entire placenta (during the early months of gestation) remaining *in situ* after curettement had been performed. The placental forceps is often an aid to the finger in curetting the uterus. Small pieces of placental tissue in the uterus may be located by the finger which can be only readily removed with forceps. Like Dr. Jaggard, I am decidedly opposed to the use of frequent intra-uterine irrigations after curettement of the puerperal uterus. I prefer to cleanse and dry its cavity with absorbent cotton or gauze, and to introduce an iodoform-gauze packing. If the cavity is septic it should be swabbed with carbolic acid or iodine before the gauze is introduced. The gauze may be left in the uterus for five or six days, unless the discharge be profuse or badly septic. The vagina should be kept packed with iodoform gauze, it being changed every twenty-four hours.

Dr. Fred Byron Robinson.—I am sorry that it has got to a point where a young man thinks that curetting the uterus is a simple thing. I meet, every little while, some young fellow, just out of college, who has heard a professor say that curetting the uterus is the thing to do, and he does it immediately. In one of the hospitals in London five hundred and forty-eight deliveries were made, with five deaths. Post-mortems made on four of these women showed that they died from rupture of pathological cysts outside of the uterus! They did not know what the one died of on whom a post-mortem was not made, but they called it puerperal fever. I am sure that, with the advance of the present time, curetting the uterus is not as much needed as is supposed, and one must be on his guard that the whole process called "puerperal fever" is not due to rupture of pathogenic cysts entirely outside of the uterus. The formation of these extra-uterine cysts (pathogenic) is due to previous invasions of infection possibly years before.

Dr. Chas. Warrington Earle.—I cannot say very much directly on Dr. Stahl's paper, but inasmuch as the general subject of curetting the uterus after abortion or at full term is before us, I desire to make a few remarks.

I am extremely happy to hear what has been said in regard to the magnitude and importance of this operation, for I believe that curetting a uterus after delivery at full term involves more responsibility than an ordinary and uncomplicated laparatomy. Believing, as I do, that it requires more care, and that there is more danger to the patient and more responsibility to the operator, than in an ordinary laparatomy, I think, as a society, we should discountenance the operation of curetting and exploring the uterus for little pieces of débris in the way it is done by a very large number of practitioners who have no experience in

the operation. It is a common thing to go into the lying-in chamber from time to time and find that the uterus has been irrigated and possibly curetted—irrigated with the common catheter or ordinary dirty syringe—and it has come to pass that everybody thinks he can do this operation as easily and safely as he can make an ordinary topical application to the os uteri. It is a question, in my mind not yet decided, whether, when we are in company with a large number of junior members of the profession, we should mention some of these operations which we are called upon to do rarely, because if we do the junior men frequently go and suggest procedures not absolutely necessary.

Some years ago, when I was lecturing upon protection of the perineum in ordinary labors, I mentioned the usual methods, and finally, as the very last thing, spoke very briefly and described the operation known as episiotomy, not supposing that any of the class would think of resorting to that operation once in a hundred cases, and possibly in a lifetime. Imagine my surprise, when in my next quiz I asked the question how would they protect the perineum in ordinary cases of labor, half a dozen men cried out, Episiotomy! The impression then which I had left on that class of young men, after speaking as thoroughly and carefully as I could of the ordinary methods of protecting the perineum, was episiotomy. They had forgotten all the ordinary methods and remembered only the operation. It is just the same with curetting and cleaning the cavity of the uterus. If we direct attention rather forcibly to this manner of treating the interior of the womb, some of our students and some practitioners will forget douching the vagina, treating diphtheritic deposits with iodine, and possibly introducing an iodoform or boric acid bacillus just within the cervical canal, and will proceed to scrape out the organ, forgetful of all its possible dangers.

I agree with Dr. Stahl partly, and partly I believe he is advocating not only an erroneous but a dangerous doctrine. A great many cases of neglected abortion, if left alone for a time, carefully watching in the meantime for some indication, will correct themselves. Even if a small amount of débris or membrane or a bit of placenta is left, it is not necessary, unless there is some indication, even with the smallest forceps, or finger, or curette, or anything else, to proceed immediately to clear out the uterus. If there is no infection the case will go on to a speedy recovery. There are other cases where the débris is in the mouth of the womb, which can be taken out easily with a very small pair of bulldog forceps without producing a particle of traumatism. If now the cervical canal is wiped out with the tincture of iodine or some other antiseptic, all has been done that is necessary.

We have, however, a third class of cases where it is necessary for us to do something. The temperature is rising, there is a bad odor, and we begin to fear sepsis. Then we have to choose whether we shall use the finger or some blunt instrument. I

believe even in many of these cases the blunt instrument can be used without trouble and to better advantage than the finger. This involves the operation for curetting the uterus, and has been so frequently given to this Society that it will not be necessary for me to even mention it.

In regard to the point raised by the essayist as to pressure on the fundus and back of the symphysis pubis in order to bring the womb within touch, I believe that while that does not produce suppuration, yet it does produce ecchymosis in some cases on the outside, and I presume some slight injury on the inside. Whether the operation suggested by Dr. Stahl is done, or by whatever process we clear out the uterine cavity, I think we should follow it by swabbing out the uterus. Some prefer carbolic acid; I prefer tincture of iodine, then insert the iodoform bacillus.

The question raised by Dr. Jaggard, whether, in every case where a small particle of membrane or a small piece of placenta is left, it is always best to go into the uterus with the finger or something else and clear it out, I believe not. It is pretty safe in the majority of cases, if no hemorrhage is present and everybody concerned has been careful, to leave very small particles rather than to subject the woman to another danger of infection by introducing the hand. I remember once taking away some membranes, perhaps four or five inches in length, days after confinement, that were perfectly white and absolutely without odor. I believe that if a careless obstetrician had introduced his finger or an instrument into the uterine cavity for these membranes he might have infected that woman.

Dr. A. H. Foster.—In regard to the removal of any fragments that may remain in the uterus in early abortion, especially in cases of hemorrhage, in my experience with some cases of alarming hemorrhage that tamponing very thoroughly would not check, it was not necessary to introduce the finger into the uterus to relieve the woman perfectly. Under aseptic precautions, with a speculum and a pair of small forceps, the os being patulous, the fragments could be reached and removed, and the uterus would immediately contract, the hemorrhage stop, and everything go on properly. Under my care it occurred in the same individual three different times, and the fourth time I was called out of town to see and assure her that her attending physician understood her case perfectly. I have since learned that the same simple treatment relieved her entirely when the hemorrhage was alarming and dangerous; no finger was used, no traumatism occurred, there was no sepsis, no fever, and nothing abnormal followed. This particular case is mentioned because it represents others in my limited experience. It is not often necessary to introduce the finger into the uterus, and I believe with Dr. Jaggard that it is with brains we must act rather than with fingers or instruments alone, and we must select and use

either according to the case, and not believe in all fingers or in all instruments without regard to the conditions of each individual case.

Dr. J. H. Etheridge reported a case of

AN ENORMOUS ABDOMINAL HEMATOMA; OPERATION; REMOVAL; CURE.

Mrs. M. B., age 31. While at stool on November 2d, 1892, she was seized with a most violent pain in the hypogastrium. The patient was gotten into bed, and the only thing that was done for her was to use hot fomentations and anodynes. From that day to this she has not been out of bed. This pain did not occur at the time of her menses. Her menstruations up to this time had been regular and normal. The abdomen began to swell, and progressively increased until, upon reaching Chicago on the 4th of January, after riding on the sleeping car forty hours, it resembled an abdomen containing a pregnancy of seven months' advancement.

During the month of December there was an attempt at the menstrual flow, the discharge being black and thin. The patient was permitted to rest for a period of three days before the abdomen was opened. Her temperature was then 103° and her pulse 120. Upon cutting into the peritoneum black fluid flowed out in great quantities, containing clots varying in size from a Lima bean to a hen's egg. Fully eight pints of this liquid and clots were discharged, when the hand was put into the abdomen, entering a cavity shut off from the peritoneal cavity, no intestines being felt. This wall was housed in by a roof of connective tissue, which pushed the intestines up in front of it, so that in reality during this entire operation the peritoneal cavity was not at all opened. Filling the pelvis was a mass, weighing at least six pounds, which appeared to be two-thirds as large as a medium-sized fetus. Friable adhesions existed all about it to the pelvic wall. It was posterior to the uterus, pushing it strongly forward and up against the pubis. With great care it was dislodged from the floor of the pelvis and delivered through the abdominal opening, after enlarging the latter well down to the pubis. This left a large cavity in the bottom of the pelvis, which did not bleed. It was carefully flushed out and packed with an enormous Mikulicz drainage. In enlarging the abdominal incision downward the fundus of the bladder was nicked, and immediately a stream of urine poured out into the wound. It was at once closed with fine silk. The abdominal opening was closed in the usual manner and the patient put to bed in a fairly good condition. A self-retaining catheter was adjusted. At the end of a week it was removed and the patient voided her urine in a satisfactory manner. In four or five days afterward the dressings presented a strong urinous odor. At once

the catheter was readjusted and remained in place for about sixteen days.

At the time of the operation the patient was very anemic and extremely weak. Granulation has gradually progressed up to the present time in a most satisfactory manner. The capacity of the opening at present does not exceed an ounce. The capacity of the cavity at the time of the operation could not have been less than one hundred and twenty ounces. The patient now presents a normal temperature and pulse, her anemia is disappearing, her strength and spirits are returning, and there is every reason to expect a complete recovery within thirty days.

As to the source of the hemorrhage naught definite can be stated. No evidence existed that it was an extra-uterine pregnancy. It is my opinion that it came from the pampiniform plexus of the left side.

Dr. H. P. Newman.—I was a witness of this operation, and was very much pleased and gratified at the readiness with which Dr. Etheridge opened up the tumor and his fortunate disposition of it. It was a very easy thing to enter this blood cavity, but it was a fearful thing, nevertheless, this immense amount of blood of unknown origin. I was particularly interested to know where it came from, and was in hopes the doctor would be able to throw some light on that. It was a remarkable case in many respects, the tumor being entirely outside of the peritoneal cavity, and its removal effected so expeditiously. Had it not been for the injury to the bladder it probably would not have consumed more than ten or fifteen minutes' time. It is interesting to note to what extent there may be extravasation of blood into the abdominal cavity, and the length of time large clots may exist, without producing fatal results. The hemorrhage in this case would have been sufficient to cause death if it had occurred suddenly, but since it took place gradually life was preserved and probably complete recovery will result. I presume the doctor's explanation of its origin is correct. I do not see how it could be otherwise when excluding the existence of tubal or extra-uterine pregnancy.

Dr. Fred Byron Robinson.—We ought to have a distinction between hematocele and hematoma. The ordinary definition of hematoma is that it is outside of the serous cavity; hematomata of the pelvis are generally in the broad ligament. This must have been a hematocele, as the doctor said he opened the peritoneal cavity; that certainly would be hematocele. The doctor is to be congratulated on the recovery of the patient, because those cases do not always recover. There is a point I wish some laparatomist would take observations on, and that is the frequency of hematocele after laparatomy. My attention was particularly called to this when I was living with Mr. Tait; during the six months I was with him I believe that fourteen or fifteen

per cent of his laparatomies had hematocele. The difficulty in these cases is to know what makes the temperature; it would go up to 101°, 102°, or even 103°, and yet the patient would recover, would get well by absorption. Dr. Martin saw a case with me the other day that I considered hematocele, occurring in a young girl after I performed laparatomy. So I think we should make a distinction between hematoma and hematocele. Hematocele is entirely inside the peritoneal cavity and hematoma is entirely outside; in hematocele there is a good chance of bleeding to death, in hematoma there is scarcely ever a chance because the pressure will stop the bleeding. It is difficult to see the relation of the ovary and Fallopian tube to this tumor; then how is it that it became shut off—how could those eight pints become shut off in the peritoneal cavity? I have shot a good many dogs to see how the peritoneum would surround the blood, and out of two hundred and thirty dogs I never saw the peritoneum surround a lot of blood like that. This may have been a hematoma, therefore outside of the peritoneal cavity, and have raised up the broad ligament; but whether it was an ectopic pregnancy or not no man can tell now, because the tube breaks where it has the least resistance, and that is where it is not covered with peritoneum. There was enormous hemorrhage and the fetus may have been carried away. Very few of these women die whose ectopic pregnancy bursts into the broad ligament.

Dr. Edward B. Weston read a paper on

KNOTS IN THE UMBILICAL CORD.

Very little is said in the text books about knots of the umbilical cord. There is little to be said. They occur rarely, and few of them are drawn tightly enough to arrest the circulation. They are obstetrical curiosities. Nothing can be done to prevent their formation; and if we knew one had formed, of course our knowledge would be of slight value to the patient.

I have two fatal cases to report. Each occurred in the last month of a first pregnancy. In the first case the woman stooped to lift some heavy object, and, as she lifted, felt an unusual commotion in her abdomen, but no movements of the child afterward. Until this day the movements had been as in a normal pregnancy. When the child was born, about two weeks later, there was a single, tightly drawn knot in the cord which completely arrested the umbilical circulation. The condition of the child indicated it had been dead two or three weeks.

In the second case the woman became sick at the stomach while in bed at night. Her husband gave her a bowl, and, sitting up, she leaned forward and vomited. She said something felt as if it turned around in her, and gradually all fetal movements, which had been unusually strong, ceased. When labor began I was sent for, and, after examining the patient, told the

husband that I believed his wife was pregnant with twins and that they were dead. The diagnosis proved correct. One child had passed through a loop in its cord and tied a single knot so tightly around the other cord that circulation was interrupted and both children killed. Delivery in this case took place at about the expected time, and the condition of the children indicated that they had been dead two or three weeks.

Dr. Weston, in closing the discussion, said: If I were to make any reply to Dr. Jaggard's criticism it would be hardly more than to re-read the report of the cases. There was no other discoverable cause for the death of the children, and the one given was perfectly sufficient. The mothers and fathers were healthy, the children of average size, and pregnancy had in each case been a normal one up to the time of the accident, which, without doubt, was the cause of death.

Dr. Franklin H. Martin showed a specimen of

FIBROID TUMOR ARISING FROM THE FUNDUS OF THE UTERUS.

The woman is 28 years old, has been married two years, had a child ten months ago. The tumor was discovered by her attending physician and she was sent to me.

I operated upon her about three weeks ago, and upon opening the abdomen this mass presented, and I must confess that at first sight of it I was very much startled, fearing that I had cut down upon a pregnant uterus, because it was so soft and smooth, and because of its perfect uniformity, without a peritoneal projection. The operation was done by Byford's method of securing the pedicle, and one point which was brought out in the case was the beauty of the Trendelenburg position for Byford's method of securing the stump. After this tumor was delivered she was put in the Trendelenburg position, and one could easily observe where the peritoneum is deflected to the broad ligament from the cul-de-sac of Douglas; so that instead of having to do the ligating entirely in the dark, the broad ligament was pulled well up and it was the simplest matter in the world to ligate it. Then in making the vaginal fixation the vagina was drawn high in the pelvis and the abdominal wall was depressed, so that the incision was a very simple matter, also the delivery of the stump through that incision. This patient recovered without symptoms.

The next specimen illustrates the hopelessness of electricity in such a case. Here we have multiple fibroids of every size and kind possible. It was impossible to deliver this tumor at first, because of its being buried in the broad ligament. It was necessary, before any progress could be made, to split down the broad ligaments in the centre to the pelvic wall and enucleate each one, tying the broad ligament on either side after splitting it, until I got down below the projecting mass, when the broad

ligament was ligated in the ordinary way. The stump was secured by a rubber ligature and afterward delivered through the vaginal wall and secured by Byford's method. I began operating on this case at 2:30 yesterday afternoon and finished at 7 o'clock in the evening. However, the patient did not lose an ounce of blood, and when I finished the operation her pulse was only 84, and to-day her temperature has been about 100° and pulse 70; and barring sepsis, which of course may occur in the best-regulated hospitals, she will get well. (The patient recovered.)

The case illustrates a subperitoneal, multiple fibroid which it would be useless to treat by electricity; such cases should be operated upon. This also demonstrates, that no matter how difficult a case may be, it does not preclude the possibility of fixing the stump in the vagina and making what seems an almost perfect operation.

Dr. Franklin H. Martin, in closing the discussion, said: In answer to Dr. Etheridge I would say that the tumor is a subperitoneal fibroid with uterus entirely below the development. A subperitoneal fibroid will not yield to electricity, although you may cure the hemorrhage of the uterus temporarily.

Dr. Fred Byron Robinson presented a specimen of tubes and ovaries removed from a married woman 21 years old, illustrating two years' progress of gonorrhea. Both tubes and ovaries were similar, except that the right tube was a pyosalpinx containing about a drachm of pus. The patient from whom he removed these specimens was infected by her husband two years ago. She has been sick for two years, but unable to do any work for a year. The husband confessed he had gonorrhea.

The broad ligament on both sides is edematous. The right tube and left tube show that they were both closed by a similar inflammatory process. But, in closing, the fimbriæ were caught and strangled in the process, and the strangled fimbriæ with their exposed infected mucous membrane soon infected the ovaries. Both ovaries were simply a mass of degenerated cysts. One ovary was the size of an orange and the other was the size of an egg, and both tubes and ovaries were bound down by numerous and strong adhesions. The normal appearance o mucous membrane of both tubes had disappeared, and in the right, where the pus was collected, it was about destroyed. The two methods of closing the tubes from gonorrheal processes were apparent here. One method is by the fimbriæ entirely retracting into the tubal lumen like the petals of a flower, when the fimbriæ will lie neatly coiled up, while the closure at the fimbriated end of the tube is accomplished by the contraction of the peritoneum.

The other method of tubal closure is where the peritoneum at the tubal end contracts from inflammatory effects, and during the closure catches some of the fimbriæ before they all fall into

the tubal lumen. The process of ovarian infection is seen to perfection in this specimen. The tubes carried the infection to the ovaries, and hence the ovarian disease is secondary to the tubal disease.

This is a typical specimen to show the slow but steady infectious process of gonorrhea. It required two years for this gonorrheal infection to make pyosalpinx and cystically degenerated ovaries. This woman suffered very severely at menstruation and was incapacitated for labor. The patient from whom I removed these specimens is up and walking around.

(To be continued.)

TRANSACTIONS OF THE EIGHTEENTH ANNUAL MEETING OF THE AMERICAN GYNECOLOGICAL SOCIETY.

HELD IN PHILADELPHIA, MAY 16TH, 17TH, AND 18TH, 1893.

(*Concluded from page* 892.)

The President, DR. THEOPHILUS PARVIN, *in the Chair*.

DR. CHAS. M. GREEN, of Boston, read a paper on

PUERPERAL ECLAMPSIA.[1]

DR. A. F. A. KING, of Washington.—I have listened with great interest to the paper, but am quite unprepared to discuss it. I may mention that in one case of puerperal convulsions I used fluid extract of veratrum hypodermically, and while it controlled the convulsions, yet the woman died. The different methods which the author has practised are those which we all know to be absolutely correct.

DR. M. D. MANN, of Buffalo.—I have used veratrum, and believe that my attention was first directed to it by a paper of Dr. King's, and I must say that I am exceedingly satisfied with the results. While my statistics are not at hand, yet I have employed it in a number of cases and the results have been better than by any other means. I would limit its use to those cases in which the pulse is rapid and the tension comparatively high—a class of symptoms which we commonly meet with. I always use it hypodermically.

[1] See original article, p. 18.

Dr. Samuel C. Busey, of Washington.—I have not any criticisms to offer on the paper of Dr. Green. I think it is the expression of treatment practised by most obstetricians. I was surprised, however, at the average mortality being as high as twenty per cent. That is higher than it should be in private practice, but it might be accounted for by the fact that only severe cases entered the hospital.

I have reached the conclusion that there ought to be little or no mortality from puerperal eclampsia in private practice where the woman has been in charge of the doctor from the beginning of pregnancy. Certainly by early prophylaxis the doctor ought to be able to prevent the occurrence of convulsions, at least in great severity. During my later practice in obstetrics I have seen no eclampsia where the patient has been under my care from the early months until term. My own experience is that the first symptom in the majority of cases is renal insufficiency; and if patients are instructed to observe the color and measure the amount of urine, I will not say every day, but certainly once a week, and call the physician's attention to the first deficiency, and also to report to him any symptoms, like headache, which may be premonitory of eclampsia, I feel sure that he will be able to ward off the attacks.

The author rather sneered at the value of venesection in the treatment of eclampsia. While it is of limited use, yet I think that it should not be discarded altogether. While I have not employed it for a number of years, yet I must say that when in early life I did use it none of the cases proved fatal. The general treatment described by Dr. Green meets with my entire approval.

Dr. Reynolds, of Boston.—One of the most interesting points in the paper is the allusion to the fact that prognosis for both mother and child rests more on the severity of the convulsion and its frequency than on any other factor. It certainly has been my experience that after a single convulsion and observation of the patient the next fifteen or twenty minutes, I have been able to give a prognosis in which I have been seldom mistaken.

I certainly cannot agree with Dr. Busey that puerperal eclampsia can be wholly avoided in private practice, or at least never prove fatal. I have seen two or three cases which seem to me to controvert that position. A woman seven months pregnant was under the care of a most careful obstetrician, one of the staff of the Lying-in Hospital in Boston, and her urine was examined by him as a matter of routine, although she was in perfect health. One morning she awoke her husband early in a convulsion. They lived within a few doors of the doctor's office, and he saw her within ten minutes, while I saw her in consultation five minutes later. The convulsion was extremely severe. The woman had stertorous breathing and was in deep coma.

We delivered her at once and subjected her, in the course of the next eight or ten hours, to every form of treatment known to either of us, including venesection, but she died before night. I do not see how in that case any prophylactic measure could have been instituted in the absence of all symptoms.

It has been my experience that post-partum eclampsia is mild, antepartum extremely dangerous, interpartum taking an intermediate position in severity, and I think that was true in the cases reported in the paper.

Dr. Edward P. Davis, of Philadelphia.—I have been greatly interested in Dr. Green's paper, and also in the method of treatment pursued by him. As an index to the probable danger of eclampsia, I have, for some time, given attention to the percentage of urea contained in the urine. In a series of over thirty cases the examination of the urine has been conducted carefully in regard to this point, and where the percentage of urea has dropped below two and a half I have felt it important to give especial attention to prophylaxis. As to the question of treatment, not only what has been given so well by Dr. Green has proven of use, but the administration of atropia, when the pulmonary edema was becoming a threatening factor, has been of decided advantage. Further, where all other forms of eliminative treatment seemed unavailing, the use of calomel as a diuretic, in one case especially which I now call to mind, was of positive value, the patient secreting urine freely, apparently because of the use of the calomel when other means had failed. She recovered.

As to the case reported by Dr. Green in which the child survived after the mother had had a number of severe convulsions, it would interest me to know what was the condition of the placenta. According to my observation the condition of the placenta has been of great importance to the fetus. Cases of abortion during eclampsia have occurred, in my observation, most frequently where there have been pathological changes in the placenta. This also is a ground for terminating the pregnancy in the interest of the fetus as well as of the mother. A most remarkable contribution to this subject before Dr. Green's is the interesting work of Dührssen. He puts his patient under the complete influence of ether, and proceeds to deliver her on the principle of a surgical operation—if dilatation is slow, making multiple incisions, using forceps, and effecting prompt delivery. It is interesting to know that his results as to mortality compare favorably with those of Dr. Green.

Dr. Green, in closing the discussion, said: With regard to veratrum viride, I am not aware it was tried in my case. The feeling was quite general among the doctors that it was not a drug which promised well under those conditions.

With regard to what Dr. Busey said, I do not wish to uphold the results at all. I brought the facts here simply to show what

had been done under the circumstances. I am ready to admit that the results would have been better, as they usually are, in private practice. It is to be remembered, however, that many of the cases were extremely bad; that all the antepartum cases were brought to the hospital in deep coma, having had a good many convulsions, some having been in convulsions a day or two before admission.

I was interested in what Dr. Busey said in regard to prophylaxis. I have never had a case of eclampsia in my own private practice, but that is not said as proof that the accident can always be prevented, for I agree with Dr. Reynolds that there are cases of eclampsia which will occur in spite of prophylaxis, and which will die in spite of treatment. But in quite a large number of cases seen by me in consultation there have been but two deaths. One was in a patient past her fortieth year, in her first confinement. She was suffering from chronic kidney trouble, but continued to live after the first convulsion for two or three weeks, and died, as was believed, chiefly of cerebral effusion. The other was seen this year, in a patient whom we endeavored to carry to the period of viability, she then being in her fourth month, but her symptoms became aggravated and she finally died of edema of the lungs.

I certainly do believe, with Dr. Busey and others, that by careful prophylactic measures we should be able to avert symptoms which are likely to culminate in eclampsia if left untreated. It is very certain that there are many cases which do culminate in eclampsia which might have been prevented by prophylaxis. It is my custom to give patients some advice as to their urine, in such a way as to avoid causing them any undue alarm. They are instructed to use the chamber at least once in twenty-four hours, so that any unusual acidity or change in quantity may be noted. I believe that a long-continued irritation from a highly acid urine is strongly prejudicial to the health of the patient and may lead to eclampsia. All know, too, that under the same conditions one patient who has a highly nervous and irritable temperament will be far more likely to have eclampsia than one who has a quiet and even temper.

Dr. Matthew D. Mann, of Buffalo, read a paper on

THE OPERATIVE TREATMENT OF FIBROIDS OF THE UTERUS.

Up to the time of the reading of the papers by Drs. Polk and Baer last year, the common method of dealing with the pedicle in operating for fibroids of the uterus in this country had been by clamp. Since then there had been a tendency to give up the clamp and try intraperitoneal methods. The object of the paper was to give the author's own experience and to bring out discussion. It did not include operations performed through the vagina, but only those where celiotomy had been

done. The total number of cases had been sixty-four, as follows: Oöphorectomy, nine, with one death; myotomy, seventeen, with one death; supravaginal hysterectomy (clamp), twenty-one, with two deaths; abdominal hysterectomy (Polk's), fifteen, with one death; supravaginal hysterectomy without ligature of the cervix (Baer's), two, with two deaths.

Commenting upon some of these cases, the author said that the first oöphorectomy he had ever performed was of this nature, and proved fatal from total suppression of urine, the kidneys being found at autopsy badly diseased. He did not believe this method of operating—removal of the appendages—was by any means certain of success. Two of the cases in which he had performed it were apparently exceedingly favorable, the tubes and ovaries were entirely removed, menstruation ceased, yet the fibroid continued to grow. In another case the patient died within a few months. It seemed to him, therefore, that while the operation had a field, it was a limited one. He would restrict it to those cases where a small fibroid was associated with diseased tubes and ovaries.

In myotomy the plan of sewing up the pedicle, if not too large, was certainly the best. A ligature placed around the whole mass after the stitches had been put in place might give additional security. Of course the number of cases to which this plan was adapted was decidedly limited, but very large tumors were sometimes found attached in this way, and in such cases there seemed to be no necessity for removing the uterus.

His results with supravaginal hysterectomy by clamp operation had been in the main satisfactory. Of the two deaths but one could be attributed in any direct way to the operation. But even though the results had been good, to his mind it had many objections. They were, the difficulty in some cases of making a good pedicle, the difficulty of managing the peritoneum around the stump, the great prolongation of convalescence, sloughing of the pedicle, danger of abscess in the abdominal walls, danger of hernia.

He had done abdominal hysterectomy for fibroids fifteen times, for cancer three, one death. The operation seemed to leave little to be desired. Certainly the ease with which it could be performed was a revelation to those who saw it for the first time. The rapid convalescence was something remarkable. The case which he had lost was one of large sloughing fibroid weighing twenty pounds, which must have infected the abdominal cavity, as the patient died of peritonitis. Thinking over the case, he thought that in all probability the cause of the sepsis had been accumulation of blood and fluid within the abdomen, which had thus formed a good culture medium for the septic germs after inoculation from the sloughing tumor, and, acting on this, he used the drainage tube in all subsequent cases, although in other

operations he seldom drained. He had never liked the operation of removal of the uterus by the vagina.

Dr. Mann was unable to account for the death in the two cases in which he had operated by the Baer method, but the manner in which he had carried out the procedure may not have been perfect. He thought he ought to have put in a glass drainage tube, as he believed it was a mistake to rely on vaginal drainage in any abdominal section. He passed gauze through the cervix, but there was no drainage, and a fatal issue took place. Baer's operation, however, had the advantage of being quicker and easier to perform than abdominal hysterectomy, and the fact of leaving the vault of the vagina intact was also an advantage.

One of the most marked effects of improved methods and consequent improvement in results had been the extension of the indications for the operation. He thought that where the fibroid, no matter what its size, was, through pain, etc., wearing the patient's life out, the operation should be done. Also, in cases of sloughing intra-uterine fibroids where septicemia already existed, and where enucleation would only add to the dangers by affording new avenues of absorption, he would do hysterectomy. He thought the time would arrive when we should remove uterine fibroids with almost as great certainty of success as in ovarian tumors, but the question of submitting to an operation should be left to the patient, and the doctor should act according to her wishes.

Dr. S. C. Gordon, of Portland, Me., read a paper entitled

THE DANGERS AND COMPLICATIONS OF UTERINE FIBROIDS.[1]

Discussion on the Papers on Fibroid Tumors of the Uterus.

Dr. Paul F. Mundé, of New York, disagreed in a most positive manner with Dr. Gordon in regard to removing the uterus for all cases of fibroid. In his own practice he did not find more than ten per cent of cases in which hysterectomy was considered advisable. It seemed to him that it would be most reckless surgery to remove the entire organ simply because it might contain a fibroid, no matter how small, even the size of a hazelnut, as he understood Dr. Gordon to advise. All knew that in many instances no symptoms whatever were ever caused by fibroids of the uterus.

Dr. William M. Polk, of New York, said he fully agreed with Dr. Mundé that it was not necessary to remove the uterus in all cases of fibroids, especially when they were of small size. But, on the other hand, where such fibroids, large or small, produce symptoms which lead the patient to seek relief, he thought that she was entitled to the operation.

[1] See original article, p. 106.

Where it was decided to perform hysterectomy, complete or incomplete, he was decidedly of the opinion that the complete operation was the one which ought to be done. It had been asserted that by leaving the cervix the operation required less time and possessed the further advantage of leaving the floor of the pelvis intact; but, as a matter of fact, both ways of operating should be carried out equally quick, and there was a disadvantage in leaving a portion of the cervical tissue, as it was liable to become degenerated subsequently or to block up purulent material. Inasmuch, then, as the incomplete operation had nothing in its favor which could not be justly claimed for the other, he thought it could not compare with it as a method of treating these cases.

Dr. Florian Krug, of New York, said he would indorse what Dr. Polk had asserted, that it was not the size of the fibroid, nor should it be our inclination to operate, that should have anything to do with the matter. We should rather be guided by the woman's complaint. There might be a large-sized fibroid which did not give rise to any symptoms whatever; and there might be a very small fibroid which made the patient a chronic invalid and rendered her life miserable, and led her to come to the doctor begging that an operation might be done. He thought that we ought not to deny the patient the benefit of our surgical experience when she demanded it.

As to the method of operating, he was on record as being in favor of total extirpation.

Dr. J. Taber Johnson, of Washington, preferred to operate by treating the stump extraperitoneally, and said that the wire serre-neud would control hemorrhage perfectly. He had operated upon twenty or thirty cases in this manner, and had found the time consumed a great deal less than he had required to perform Baer's in one case. Dr. Baer, he understood, required only thirty or thirty-five minutes, but in the single instance in which he had operated by that method it had required an hour and a half. Altogether he had only lost three cases after hysterectomy for fibroids. He quite agreed with Dr. Polk that where a small fibroid existed and could be removed by enucleation it would be quite improper to remove the entire organ.

Dr A. W. Johnstone, of Cincinnati, said his experience with hysterectomy for fibroids had been limited—fifteen or twenty in number—but he had not lost any patients.

Dr. Joseph Price, of Philadelphia, said his experience with hysterectomy in these cases had been rather large and varied. In past years he had exchanged some rather hard blows during discussions upon this subject, but it seemed to-day there was rather a uniform consensus of opinion as to the importance of surgery, both early and late. With regard to retrograde changes in these growths, referred to by Dr. Gordon, he had had considerable and painful experience in this line. It was common in medi-

cal societies to hear certain practitioners say that they had had a large experience with these cases, that they had seen as many as six, ten, or twenty, and that in their opinion surgical interference was not called for. Dr. Price took pleasure in asking such gentlemen what had become of their patients. He knew something about a part of them. They had gone to this, that, or the other gynecologist to be rescued from the grave at a time when it required the combined efforts of surgery and a miracle to save them. Early in his experience he had met with a number of cases of fibroid which had gone on to malignant change, and he cited at least two in which a fatal result had followed operation.

As to multinodular small fibroids, he had found removal of the appendages a valuable means of checking their growth and relieving the symptoms due to their presence.

As to the importance of drainage, he would simply have to give up his work if it were not for abundant drainage. He valued it above all other means in saving life. It was true, however, he had very few cases of simple operations. He operated constantly for advanced disease, yet his mortality would fall below five per cent, and he attributed it largely to the uniform practice of drainage.

Dr. William E. Ford, of Utica, said that he lived in a town of about fifty thousand inhabitants, and cases operated upon were not likely to be lost sight of, and if they did not get well it was likely to be widely known and injure the surgeon's reputation. Under such circumstances they certainly would not be justified or upheld in operating on all cases of fibroids of the uterus, especially where the tumors were small or gave rise to but few symptoms. Therefore he had made use of electricity and other means which would tend to relieve the symptoms, and operated only after it became quite necessary. He most thoroughly indorsed the position of Dr. Mundé that it would be wrong to extirpate every uterus which might contain a fibroid, no matter how small it might be or how free the woman might be from symptoms.

Dr. W. Gill Wylie, of New York, said that his first hysterectomy for fibroids was performed in Bellevue ten years ago, and since then his experience had been considerable. He could say that any other measures excepting surgical offered very little hope. In answer to the last speaker, he said that although the surgeons in the city might lose sight of their cases not long after the operation, they also saw now and then one which had been treated by other means than surgical, from the country, with such results that even hysterectomy was much less promising than it would have been at an earlier date. For instance, he had seen two of Dr. Ford's cases treated by electricity, and in both there was local peritonitis, hematoma, in one a large double hematoma. Both patients recovered after hysterectomy. With regard to methods of operating and of treatment, he

always took into first consideration the saving of the patient's life, and then that of effecting a cure of the symptoms. He did not believe at all in removing the uterus in all cases of fibroids, for in some he had curetted and resorted to such treatment as seemed indicated short of laparatomy, and the patients had subsequently become pregnant. Then there were some cases in which a symptomatic cure could be effected by removal of the appendages. Dr. Wylie expressed no sympathy with electricity.

Dr. McGonegal, of San Francisco, by invitation, expressed his interest in the discussion and the varied opinions which it had elicited. He thought we were doing a great many more operations than we used to, and he thought they were in the main justifiable. Of course Dr. Gordon had gone a long way in saying that all uteri which contained fibroids ought to be removed. He did not think that fast rules in regard to operating should be laid down. He had performed the method by fixing the stump in the abdominal wall in one instance, and was much pleased with it. Dr. Baer's method struck him as being very simple; and he had seen that of Drs. Goffe and Dudley performed four times, and had also been pleased with that; yet he believed that if he were to do the intraperitoneal operation he would use the method of Polk, preferring to leave no portion of the womb.

Dr. A. Palmer Dudley, of New York, advocated, as he had done on former occasions, the intraperitoneal method, but leaving the cervix as a stump outside the peritoneum—the method which had been referred to during the discussion as that of Goffe and Dudley. Kimball, he said, was not the first to perform hysterectomy for fibroid, that gentleman having stated that he was present at the first operation, which was performed by Dr. Burnham, of Louisville.

Dr. Wathen, of Louisville, thought the discussion had been an interesting one, and showed the rapid progress we had been making in the treatment of fibroid tumors. He was inclined to the opinion that no one method would ever be universally adopted. The only one which he had practised had been fastening the stump in the abdominal wound, but he was inclined to think that some of the intraperitoneal methods would be preferable in certain cases.

Dr. Noble, of Philadelphia, had removed the appendages for fibroids in about sixteen cases, and in all there had been a systematic cure except one. He called attention to the fact that it was not proper to speak of the methods of treating the stump practised by Dudley, Goffe, and Baer as intraperitoneal. The stump was quite extraperitoneal, and to confound the method with the intraperitoneal would prejudice many men against it. He did not believe that drainage was necessary, unless in very exceptional cases, and in the only one in which he had employed it a sinus had formed, due, no doubt, to the use of the

drainage tube. Drainage was called for only when there was septic matter in the pelvis.

The readers of the papers were called upon in turn to make some closing remarks. Dr. Gordon said that it was not his intention to convey the idea that the uterus should be removed in every case of fibroid. When these were very small and no symptoms resulted the patient was not likely to consult the doctor. But where there were sufficient symptoms to cause the patient to seek relief he would do hysterectomy.

Dr. Goffe said that the method which he had described was not intraperitoneal, but intrapelvic and extraperitoneal.

Dr. Mann replied to the arguments in favor of leaving the cervix, and expressed the opinion that the advantages were fanciful. It was better to leave no part of the uterus for subsequent degeneration of any form. He had spoken to several gentlemen who had performed Dr. Polk's operation, and had thus collected sixty-eight cases with five deaths, which he regarded as a good showing. With regard to drainage, and the statement that it was unnecessary as there was no sepsis in the pelvis, Dr. Mann claimed that the vagina could not be opened in total extirpation or partial extirpation, leaving only the cervix, without danger of inoculating the pelvis with septic germs.

Dr. A. J. C. Skene, of Brooklyn, read an essay entitled

PATHOLOGY AND TREATMENT OF INJURIES OF THE PELVIC FLOOR.

Considered as a mechanical structure, the pelvic floor resembles a diaphragm composed of muscles and fascia which close the pelvic outlet, its borders being attached to the bony walls, and being held at the proper elevation by the levator ani muscles. Its mechanism is based upon the principle of the suspension bridge, the anchorage being represented by the pelvic bones, the floor representing the bridge, and the levator ani muscles corresponding to the sustaining cables.

All injuries sustained by the pelvic floor may be divided into two classes, as follows: first, those that occur in the median line in a direction corresponding to the axis of the pelvis; second, those injuries which occur above the floor itself—transverse internal lacerations.

Lacerations in the median line occur in various forms and degrees: first, a solution of continuity of all the tissues extending from the posterior commissure to the sphincter ani; second, the same injury plus laceration of the sphincter. To these varieties, which have been recognized in all ages, the author added another—subcutaneous laceration of the muscles and fascia in the median line, usually limited to the transverse perinei muscle and fascia, but in rare cases involving the sphincter ani, three cases or more having come under the author's observation.

The second class of injuries are transverse, and have been

described as internal lacerations, consisting in laceration of the anterior fibres of the levator ani muscle and fascia, usually attended with separation of the muscular layer of the vaginal wall from the pelvic floor. As a rule, if there is laceration of the levator ani it is subcutaneous, not attended with laceration of the mucous membrane of the vaginal wall. Lacerations are most easily detected by grasping the pelvic floor in the median line between the thumb and finger.

Dr. Skene is fully convinced that, although rectocele is said to follow transverse lacerations, it can do so only in rare instances; that the usual so-called rectocele is not a rectocele at all, but a prolapsus of the vaginal wall with a varicose condition of the veins. This form of injury, when it involves the levator ani, is attended by more distressing symptoms and secondary pathological changes than any other. When it has lasted for years atrophy of the levator ani, etc., takes place, and no operative procedure can then bring about a cure. The thinning of the tissues might mislead one to suppose there had been subcutaneous laceration. With slight modifications he accepted the treatment, and fully the pathology, of complete laceration involving the sphincter ani, as presented by Dr. Thomas Addis Emmet.

The author expressed some surprise that there still existed so little agreement among gynecologists as to the best manner of repairing injuries to the pelvic floor, but thought it was due to imperfect understanding of the pathology.

In median-line injuries he operated by simply removing the scar tissue, refreshing the ends of the muscles and fascia which have been divided. The vaginal wall, which had been attached to the lower angle of the laceration, is liberated and raised so as to form the inner surface of the pelvic floor. In complete lacerations involving the sphincter ani he follows closely the principles laid down by Emmet, varying from him in the steps of the operation only in unimportant particulars. In subcutaneous laceration in the median line involving the fascia and transverse perinei alone, he makes the laceration complete by dividing the integument from the posterior commissure down to the upper border of the sphincter ani, trims away superfluous tissue, and closes the wound substantially as in recent lacerations. In the treatment of transverse or internal lacerations he has found that Emmet's method fulfils every indication where the pelvic floor itself is in perfect condition, but it is necessary to do something more where the pelvic floor has sustained a subcutaneous laceration or when atrophy has occurred in the median line from stretching. He has also obtained better results by treating the so-called rectocele somewhat differently, causing by incision a complete median laceration, bringing together the edges of the vagina down to the muscular tissue of the pelvic floor, then closing from below upward muscle, fascia, and integument,

crowding the enlarged vessels and cellular tissue back, and uniting the vaginal wall to the floor of the pelvis with sutures which bring together the lateral edges of the pelvic floor.

The following officers were elected for the ensuing year:
President: Dr. Wm. T. Lusk, of New York.
Vice-Presidents: Dr. Samuel C. Busey, of Washington, and Dr. Bache McE. Emmet, of New York.
Secretary: Dr. H. C. Coe, of New York.
Treasurer: Dr. M. D. Mann, of Buffalo.
The next meeting will be held in Washington in May, 1894.

ITEMS.

1. At a meeting of the Medical Board of the New York Foundling Hospital, held January 2d, 1893, the following preamble and resolutions were adopted:

The Medical Board of the New York Foundling Hospital with sorrowful feelings deplores the loss of one of its members in the person of the late Dr. Charles Carroll Lee, an attending physician at the hospital from nearly its inception a quarter of a century ago.

A man of courtly manners, he was at the same time most simple and kind-hearted.

In the early years of his professional life he answered the trump of his country's call and served with the army as assistant surgeon until the close of the war.

His knowledge of his profession was varied, sound, and extensive, and he coupled with this a wonderful grace and tact that made him a most pleasant man to meet.

As a citizen, relative, and friend he was rich in the possession of a superabundance of civic and domestic virtues, and all these eminent attainments, added to the excellence of a spotless private character, were appreciated not only by his immediate colleagues but by the profession at large. It can safely be said of him that while he was a good physician, he was a true man, prompt and efficient in all that pertained to professional life; no laggard was he. We feel that he has passed to his reward, to enjoy the dawning of that celestial day that knows no night, the recompense of a useful and well-spent life.

Resolved, That to his bereaved family our respectful sympathy we tender, and that a copy of this preamble and resolution be sent to them; also, that a copy of the same be spread in a

minute on the records of the Medical Board and published in the medical journals of this city.

J. Lewis Smith, M.D.,
George F. Carey, M.D.,
John P. McGowan, M.D.,
Committee.

2. All members of the medical profession are cordially invited to attend the meetings of the Section on Gynecology and Abdominal Surgery of the Pan-American Medical Congress, to be held in Washington, September 5th, 6th, 7th, and 8th.

The sessions promise to be exceptionally interesting, many valuable papers having been contributed. Those who may wish to read papers before this section, and who have not yet sent in their titles and skeleton abstracts, are requested to do so at once.

Papers have already been contributed by the following distinguished gentlemen from the United States and Canada: Drs. T. Johnson Alloway, Montreal, Can.; A. W. Abbott, Minneapolis, Minn.; J. M. Baldy, Philadelphia, Pa.; H. J. Boldt, New York City; Augustus P. Clarke, Cambridge, Mass.; Ernest W. Cushing, Boston, Mass.; Andrew F. Currier, New York City; L. H. Dunning, Indianapolis, Ind.; Geo. R. Deane, Spartansburg, S. C.; W. E. B. Davis, Birmingham, Ala.; Joseph Eastman, Indianapolis, Ind.; Geo. M. Edebohls, New York City; De Saussure Ford, Augusta, Ga.; William Gardner, Montreal, Can.; T. H. Hawkins, Denver, Col.; John R. Haynes, Los Angeles, Cal.; Edw. W. Jenks, Detroit, Mich.; Jos. Taber Johnson, Washington, D. C.; Howard A. Kelly, Baltimore, Md.; Florian Krug, New York City; G. Betton Massey, Philadelphia, Pa.; Lewis S. McMurtry, Louisville, Ky.; R. B. Maury, Memphis, Tenn.; Wm. F. Myers, Ft. Wayne, Ind.; E. E. Montgomery, Philadelphia, Pa.; Robert T. Morris, New York City; Chas. P. Noble, Philadelphia, Pa.; Jos. Price, Philadelphia, Pa.; Geo. H. Rohé, Baltimore, Md.; Jas. F. W. Ross, Toronto, Can.; Chas. A. L. Reed, Cincinnati, O.; I. S. Stone, Washington, D. C.; R. Stansbury Sutton, Pittsburg, Pa.; T. Algernon Temple, Toronto, Can.; A. Vander Veer, Albany, N. Y.; W. B. Ward, Topeka, Kan.

Brooks H. Wells,
71 West 45th St., N. Y. City,
English-Speaking Secretary.

W. W. Potter,
Executive President.

3. The nineteenth annual meeting of the Mississippi Valley Medical Association will occur in Indianapolis, Wednesday, Thursday, and Friday, October 4th, 5th, and 6th, 1893. A gene-

ral session will be held each morning, and the afternoons will be devoted to section work. There will be three sections at this meeting—viz., one on general medicine, one on general surgery, and one on obstetrics and gynecology, the last-mentioned having been added since the last meeting. The profession of Indianapolis is united in extending a cordial invitation to physicians and their families to attend the meeting. Reduced railroad rates will be provided, further notice of which will be given. The secretary will be glad to receive titles from those physicians desiring to favor the Association with papers. It is especially requested that these titles be sent as early as possible, in order to give ample opportunity for the appointment of leaders in discussion. The secretary will take pleasure in giving any information in connection with the meeting.

FREDERICK C. WOODBURN, *Secretary*,
399 College avenue.

4. THE third annual meeting of the AMERICAN ELECTRO-THERAPEUTIC ASSOCIATION will be held in Chicago, September 12th, 13th, and 14th, at Apollo Hall, Central Music Hall Block. Members of the medical profession interested in electrotherapeutics are cordially invited to attend.

AUGUSTIN H. GOELET, M.D.,
President.

MARGARET A. CLEAVES, M.D.,
Secretary,
68 Madison Ave., New York City.

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ORIGINAL COMMUNICATIONS.

REMARKS ON APPENDICITIS,

WITH REPORTS OF CASES.[1]

BY

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Professor of Surgery, Chicago Polyclinic, and College of Physicians and Surgeons, Chicago.

(With nine illustrations.)

I SHALL not attempt to go through this vast subject in detail, as the literature during the last ten years has increased to an enormous extent, but I will limit myself to a sketch of the latest investigations on the subject and the controversial points brought up by the modern surgical treatment of the disease.

PATHOLOGY. I. *Appendix.*—Inflammation of the mucosa is in all probability most often caused by extension from a catarrhal inflammation of the cecum, because fecal concretions are found in less than one-half (thirty-nine per cent—Ranvers) of the cases of perforation, and because foreign bodies and ulcers are only exceptionally seen. Thus we may say with Iversen

[1] Read before the Gynecological Society of Chicago, March 17th, 1893.

and Kümmel that the cause of the initial catarrh of the appendix is unknown. The swelling of the mucosa leads to stenosis at the narrowest point, at Gerlach's valve, and the products of hypersecretion are retained in the appendix. Septic material from the contents invades the wall either through intact epithelium, which is most common, or through a loss of substance by ulceration (Senn, Högh).

Microscopical examination of the wall of the appendix reveals evidences of septic lymphangitis, swelling of the mucosa and the solitary glands, and filling of the paravascular spaces in the muscularis and subserosa by leucocytes (Senn, Iversen). In the subserosa diffused islands of leucocytes (Iversen) or miliary microscopical abscesses are seen, as in my Case 13.

The lymphangitis and diffuse inflammation are more pronounced in the subperitoneal tissue than in the muscular coat; this explains why plastic peritonitis is an almost constant consequence, and accounts for the adhesions in which the appendix is afterward found buried.

This catarrhal inflammation may subside (Iversen), the opening into the appendix again become patent, and after one or more attacks permanent recovery with a normal appendix takes place. A transparent veil of fine adhesions binding the appendix to its surroundings alone remains as an evidence of the appendicitis of years ago (my Case 15). More often, perhaps, a partial or total obliteration of the lumen of the appendix remains (Ranvers; my Cases 3 and 13).

Virulent acute septic inflammation is often caused by fecal concretions. It takes the form of diffused phlegmonous inflammation terminating in gangrene or necrosis of usually a small portion of the wall, but rarely of the entire appendix up to the cecum, as in Case 1. When the dead tissue is separated we have a perforation corresponding in size to the necrotic territory. The fecal concretions remain in the appendix or fall out[1] into the peritoneal cavity, or the whole or a part of the appendix is separated and floating in the fecal peritonitic exudate.

A localized annular necrosis is seen in Fig. 9, Case 14, close to the cecum, with mucosa and muscularis absent, and with a small perforation in the serosa leading into a small cavity communicating with the cecum.

[1] See Fig. 1, Case 2.

Perforative inflammation of the appendix is common behind a stricture (Kümmel), and multiple small openings are often found in appendices removed because of chronic or intermittent appendicitis.

Perforation of the appendix almost always occurs in the more severe cases. In 87 cases reported by Weir 84 perforations were observed, and in only 3 cases was the wall intact. In the milder cases, which terminate in resolution, the wall is not perforated (Lange). In mild localized cases of intermittent appendicitis, however, perforation frequently exists. A small opening and a slow process of perforation do not necessarily lead to a serious attack.

Location of the Diseased Appendix.—It is important for diagnosis as well as for operation to know where the appendix is most often found. The interesting investigations of Bryant show that the appendix was found, in the 144 cases he tabulated, behind the cecum in 32 cases; on medial side of cecum in 34 cases; below and on medial side of cecum in 28 cases; below and down toward the pelvis minor in 21 cases; straight down in the iliac fossa in 5 cases; outward and on outer side of cecum, at different heights, in 2, 3, and 4 cases; and on medial side of cecum, high up toward the liver, in 1 case.

It will be seen that McBurney's point, about which there has been so much debate lately, corresponds very well with the location of the appendix, and consequently with the centre of the disease, in 66 if not in 115 of the 144 cases reported. Consequently, although McBurney's point is not an absolute guide, it is nevertheless of value in the majority of cases.

The location of the perityphlitic abscess will therefore be (as Lange has pointed out) in one of the following places: (1) around the cecum in the iliac fossa above the outer half of Poupart's ligament and upon the anterior wall of the abdomen; (2) on the medial side of the cecum; (3) rarely in the small pelvis; (4) on the outer lateral side of the cecum, extending up into the lumbar or renal regions.

The inflammation may extend to the surroundings of the appendix in two directions: first, to the peritoneal cavity; and second, to the retroperitoneal tissues.

1. *Extension to the Peritoneal Cavity.*—Peritonitis, whether caused by a mere lymphangitis or by a perforation and fecal extravasation, may cease or become limited at any point from

the immediate neighborhood of the diseased appendix to the entire peritoneal cavity. The causes for limitation, many of which are unknown, I shall pass by, with the exception of the anatomical conditions which influence the limitation of a spreading peritonitis, as pointed out by Mikulicz. He points out that certain natural barriers aid in the localization of the inflammation. The transverse colon and large omentum divide the abdomen into supra- and infra-omental spaces. The infra-omental space is again divided obliquely by the mesentery of the small intestine into supra- and infra-mesenteric portions. The supra-omental space is divided by the liver into a subphrenic and an infrahepatic portion. All the barriers are located transversely and thus oppose extension in a vertical direction. The transverse colon and omentum protect the larger median part of the abdomen only. On the lateral sides of the ascending and descending colon there are no barriers to prevent extension in a vertical direction. The barriers are active in limiting extension from below upward only, while from above downward septic fluid will sink, by gravitation, unopposed to the bottom of the small pelvis. These anatomical facts and points correspond as well to the clinical experience as to the extension of peritonitis from a focus anywhere in the peritoneal cavity.

2. *Extension to the Retroperitoneal Tissue or Space.*—Körte has called attention to the extension of septic inflammation through the mesenteriolum of the appendix. Experiments upon the cadaver—namely, injection of a colored fluid through a canula pushed from the lumen of the appendix into the mesenteriolum—showed that the fluid would penetrate into or between the two folds of the mesenteriolum, then into the retroperitoneal tissue in the iliac fossa, from there upward into the perirenal tissue, and finally up behind the liver. It is well known that abscesses are often located in these places, sometimes simultaneously in more than one, and not infrequently the only communication between the abscesses is through a narrow canal.

General Course and Prognosis of Appendicitis.—At the present day, when surgery, or rather surgeons are on the verge of claiming appendicitis almost to exclusion of the claims of internal medicine, it is important to remember that, on the whole, appendicitis is a benignant disease with a good prognosis, and

that in the great majority of cases surgical interference is not called for. Taking it for granted that perityphlitis originates from the appendix in the great majority of cases—Einhorn, from post-mortem material of Bollinger's in Munich, found the appendix diseased in 91 per cent and the cecum in only 9 per cent—we are practically justified in applying the clinical statistics in this respect to appendicitis.

The mortality in general of appendicitis is only about 5 per cent. Pepper stated that twenty cases to one are permanently cured without operation. Ranvers collected from the reports of the Prussian army 2,000 cases with 96 per cent of cures without operation; and from four years' service in the Charité Hospital in Berlin, 54 cases with 3 deaths, or 94.5 per cent of cures. I. Vollert gives the statistics for seven and three-quarter years at Nothnagel's clinic in Vienna as 65 cases with 3 deaths, or 95.4 per cent of cures; 34 were cured, 25 improved, 2 not cured, 1 was sent to the surgical clinic, and 3 died. Fürbringer reports a mortality of 10 per cent.

The condition of the appendix in cases in which one or more attacks of appendicitis have terminated in permanent cure has been investigated by Ranvers. He examined by autopsy 13 cases, and found in almost every case complete obliteration of the entire appendix. The appendix was buried in adhesions down to the cecum. The cecal serosa was thickened, adherent to the wall of the pelvis, but not to loops of intestine. In the obliterated appendix he found only once a small fecal concretion, surrounded by a capsule of cicatricial tissue. Ranvers said that it was impossible to state whether or not perforation had existed in these cases, but that from the detailed pathological conditions he regarded it as highly probable that perforation had taken place.

Lange attempts to explain the discrepancy between our home literature and these facts by stating that the surgeon sees only the severe cases; that the most severe cases of appendicitis are not treated in the hospitals, but die at home; and that severe cases of appendicitis are probably more common in America than in Europe on account of the different mode of life, diet, etc.

The facts mentioned above seem to me to put an end to any absolute claim of surgery upon appendicitis.

Clinical Forms of Appendicitis:

1. Diffuse peritonitis.
 (*a*) Acute sepsis.
 (*b*) Acute diffuse suppurative peritonitis.
 (*c*) Subacute progressive peritonitis (Mikulicz).
2. Localized suppurative peritonitis—perityphlitic abscess.
3. Recurring chronic appendicitis and peri-appendicitis.
4. Adhesive appendicular peritonitis with localized non-suppurative peri-appendicitis—Keen's mild form.
5. Late consequences following appendicitis: chronic abscess, bands, adhesions, intestinal obstruction, pain.

I shall consider these forms in the order named, with the exception of adhesive non-suppurative appendicitis, which has no relation to surgery.

I. Diffuse Peritonitis.—I have operated in this form of appendicitis in the following eleven cases, only one of which recovered:

Case I. *Diffuse gangrene of appendix; commencing diffuse peritonitis; extirpation of appendix three days after symptoms of appendicitis had appeared, and twenty-nine hours after symptoms of diffuse peritonitis had set in; recovery.*—Mrs. H., 35 years of age. Previous health good. December 28th, 1889, had a chill followed by moderate fever. December 29th, fever. December 30th was up and around the house. December 31st was attacked with pain in the left iliac region and vomited all night. January 1st, 1890, acute pain over entire abdomen, which was later localized to the right iliac region. At noon, January 2d, the patient had a chill followed by collapse. At 7:30 P.M. her temperature was 104°, pulse 150. After consultation with Dr. Denslow Lewis, who kindly assisted at the operation, I extirpated the appendix in the following manner:

A lateral longitudinal incision was made. The small intestine was red and injected. The cecum could not be brought out of the wound. The appendix was surrounded by fetid, purulent, bloody fluid, was non-adherent, gangrenous, grayish, discolored to close to the cecum, and contained two fecal concretions. No perforation of the wall had taken place. The appendix was now ligated and extirpated. An attempt was made to cover the wound with the wall of the cecum and with the red, thickened mesenteriolum. This was partially successful. The abdominal cavity was washed out with sterilized water,

gauze and glass drains introduced. The drains were taken out on the third day, and all the stitches removed on the eighth day. Convalescence was slow, but the patient finally recovered.

CASE II. *Localized gangrene of appendix; perforation; fecal stone; diffuse peritonitis; extirpation of appendix; death after twelve hours.*—October 8th, 1892, I was called in consultation with Drs. Johnson and Billings to see Mr. S. The patient, a lumber merchant 46 years of age, had previously been healthy. On October 5th he went to Grand Rapids. While there walked about a good deal and ate some grapes. On October 6th he returned to Chicago and was attacked by pain in the abdomen and vomiting. The next day Dr. Johnson was called to see the patient. Temperature 102°; pulse 96, strong. There were pain and tenderness localized in the right iliac fossa. The bowels had not moved for several days. Morphine and salines were given. On October 8th, at noon, he was attacked by sudden, acute pain in the lower part of the abdomen. Vomiting, clammy perspiration, collapse; pulse 120.

Consultation at 4 P.M. The patient was in bed; pulse 120, weak; temperature 101°. He complained of pain on coughing. The abdomen was tense, tympanitic, hard. The tympanites rendered the liver dulness uncertain. A dull area the size of the palm of the hand was found over the cecal region. The characteristic facies peritonitica was not present, the patient was not cold, the right leg could be moved without pain, and the abdomen was not very tender. At 6 o'clock the collapse was greater; pulse 150, temperature 100°; no pain, patient subjectively better.

Operation at 6:30 P.M. Lateral incision six to seven inches in length. The abdominal walls were very thick on account of the corpulence of the patient. On opening the peritoneal cavity a little thin, grayish, fecal fluid escaped. The omentum and intestine were congested. Exudate on borders of small intestine. The appendix was found deep down and could with difficulty be brought into the wound. A fecal concretion was squeezed out of the appendix, whose mesenteriolum was thick and rigid. The appendix was ligated after tying the mesenteriolum, which could not be ligated in portions on account of the thickness of the abdominal walls and the impossibility of getting sufficient room for the procedure even after transverse division of the rectus muscle. The abdomen was flushed out with warm sterilized water, a gauze and three glass

drains introduced, and the wound united. The patient at the end of the operation was pulseless.

At 11:30 the patient had no pain, felt well, and joked with his friends. Temperature 101°, pulse 130. An hour later the pulse was 136 and extremely weak. At 2 A.M. temperature 102°, pulse 134. The pulse became weaker and could not be counted. Just before his death at 6:30 A.M. he vomited a large quantity of black matter resembling coffee grounds.

Autopsy showed diffuse plastic peritonitis. In the iliac fossa a teaspoonful of brown, gangrenous-looking fluid was found. (See Fig. 1.)

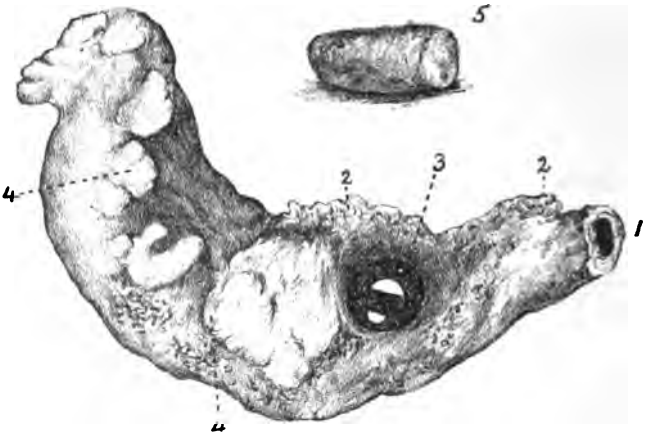


FIG. 1 (Case 2).—Appendix eleven centimetres long. 1, Cecal end; 2, mesenteriolum appendicis; 3, perforation opening surrounded by area of gangrene, where wall of intestine is as thin as paper, dark brown, and discolored; in centre are two openings from the perforation in the mesenteric attachment of the appendix out through both sides of the mesentery; 4, swollen, red epiploitic appendices along both sides of the appendix; 5, fecal concretion.

CASE III. *Non-perforative appendicitis; two grape seeds taken from appendix; old obliteration of distal half of appendix; extirpation of appendix; diffuse hemorrhagic peritonitis; death after thirty-six hours.*—Mrs. F. H. J., 35 years of age; father living, mother died from vesical cancer; married twelve years; never pregnant; has been under the care of an eminent gynecologist for dyspareunia and sterility. November 5th, 1892, while patient was in New York, she ate grapes and swallowed the seeds. Two days later she had pain in the right iliac region external to the ascending colon. November 12th she had pain which was controlled by opium, which, however, caused nausea and vomiting. November 19th examination in consulta-

tation with Dr. Ryan, of Springfield, Ill. No tympanites; slight, hardly perceptible fulness over cecum; tenderness on deep pressure over cecum; no appetite; has obtained sleep and relief from pain only by the use of opiates for the past week. The bowels had been moved every day or two by Hunyadi water or Epsom salts, but she experienced neither relief nor increase of pain after bowels moved. There has never been any swelling in the region of the appendix, but only tenderness. For the past week the temperature has ranged from 99.5° to 100°, the pulse from 90 to 120. Tympanites was first noticed on November 18th.

The patient did not have the facies peritonitica. Diffuse tympanites; liver and spleen pushed up. Increased abdominal tension. No tumor, no dulness. Greatest tenderness on pressure between anterior superior iliac spine and umbilicus. Vaginal and rectal examination negative.

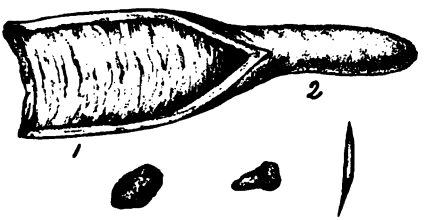


FIG. 2 (Case 3).—Appendix five centimetres long. 1, Cecal half dilated; contains fluid feces, two grape seeds, one fecal concretion the size of a split pea, and the husk of an oat. Mucosa not ulcerated, but swollen and reddish. 2, Distal half of appendix obliterated. Microscopic examination shows epithelium everywhere present. Mucosa thickened and shows a mass of embryonal cells and enlarged solitary follicles, with small empty spaces in the centre, possibly representing miliary abscesses in these little lymph glands. In muscularis paravascular infiltration with leucocytes, and in the subserous tissue in some places diffuse infiltration, in others paravascular infiltration, but much more extensive than in the muscularis.

Operation November 19th, assisted by Drs. Ryan, Townsend, Dresser, and Bernauer. Lateral incision five inches long to the ligamentum Fallopii. The peritoneum was united to the skin. The omentum was red and velvety. The cecum on its under side was red, injected, velvety, not shining; no fibrinous, whitish exudate, but on lifting up omentum an ounce or two of thin, bloody, odorless fluid welled out. On lifting up the cecum more of this fluid gushed out. The ileum was also distended and red, the appendix buried in or adherent to loops of small intestine and the right Fallopian tube, which was normal. The

adhesions were recent and were easily separated, upon which more of the thin red fluid welled up. The appendix with the cecum was lifted out of the wound. Free fecal circulation in the cecal half of the appendix, in which air and fecal matter could be felt to move. The distal half of the appendix was obliterated. (See Fig. 2.)

The mesenteriolum was now ligated in portions and the appendix close to the cecum ligated *en masse*. After careful packing of the abdominal cavity with sponges the appendix was divided by scissors and the cecum emptied in order to diminish the enormous dilatation, which seemed to threaten rupture on manipulation. When the cecum was empty the stump of the appendix was ligated *en masse*, the mucous membrane removed, and the walls of the appendix stitched together. The cecum was folded in over the stump of the appendix by means of Lembert's sutures, but with great difficulty because of the friability of the intestinal wall. The omentum could not be drawn down as a covering. The adjacent loops of the ileum were bathed in red fluid, but there was no yellow, fibrinous exudate. In the triangular space between a lower loop of the ileum, near the ileo-cecal valve, and two other loops of intestine parallel and in contact with it, there was a ridge of reddish, fibrinous exudate resembling that found in dry diffuse peritonitis, except that it was reddish and not white. This indicated a somewhat dry hemorrhagic peritonitis with exudate around the appendix and on the lateral side of cecum and ascending colon.

The patient was now turned a little on the right side and the cavity flushed with warm sterilized water. The sponges were removed and the abdominal cavity cleansed with sponges on long forceps passed down into Douglas' fossa and up external to the ascending colon. The wound was then closed, gauze packing and a glass drain introduced, and dressings applied. The operation lasted one hour.

5 P.M.: Patient speaks rationally; not restless; pulse 120; no pain, no facies peritonitica. 10 P.M.: Wound dressed; no fluid in tube; pulse 120, temperature 103.5°. Patient died thirty-six hours after the operation.

CASE IV.—A boy, age 6; had had acute appendicitis for three days. No distinct tumor could be made out. On the fourth day, as the symptoms were increasing, laparatomy was performed. Feculent pus was found around the cecum. The

appendix was not accessible. The wound was disinfected and drained. The patient died on the following day.

CASE V.—Man, 35 years of age; kindly referred to me by Dr. Potter, of Atlantic, Iowa. He was suffering from appendicitis and diffuse peritonitis. I made a lateral laparatomy in the second week of the disease, washed out abdomen with sterilized water, and drained. The patient died on the following day.

CASE VI. *Acute perforative appendicitis; spreading purulent peritonitis; lateral laparatomy; death after twelve hours.* —Mrs. A., 35 years of age; was seen by me in consultation with Dr. Henrotin, August 19th, 1891. She had been suffering for four days with peritonitis accompanied by vomiting, and pain in right side of abdomen. There was some tympanites, but no tumor. The following day I made a lateral laparatomy. The incision extended upward over the cecum from an inch above Poupart's ligament a distance of four inches, later increased to six inches along the right rectus muscle. Fetid pus was found along the outer side of the cecum and up as far as the liver. Upon separating the transverse colon from the lower surface of the liver, another cavity, not connected with the first, was found, which contained four or five ounces of pus. The abdomen was flushed with sterilized water, gauze and glass drains introduced, and the wound closed and dressed in the usual manner. The patient died in less than twelve hours after the operation.

At the autopsy Dr. Henrotin found a perforation of the appendix and an accumulation of pus between the liver and the stomach, which had not been found at the time of the operation.

CASE VII. *Limited appendicitis for two months; sudden onset of peritonitis ten days prior to operation; remission after two days; exacerbation three days later; large exudate apparently localized in right iliac and lumbar regions; oblique lateral laparatomy; counter-opening in lumbar region; appendix not removed; death after forty hours.*—Miss A. A., 20 years of age. Family history good. Patient had always been healthy until August, 1891, when she had an attack of pain and soreness in the right iliac region. Until October 15th, however, notwithstanding the pain, she attended to her ordinary duties. On that day she had a sudden increase in the pain, with vomiting, and was obliged to go to bed. She was better for a few days, then had another increase of pain which extended from the

right iliac fossa up along the outer side of the colon into the postrenal region.

I saw the patient, in consultation with Dr. Bradley, on October 24th. She was pale, did not have the characteristic facies peritonitica. Pulse 108, temperature 101°. She had vomited once in the last twenty-four hours. There was a hard swelling over the cecum, extending from Poupart's ligament up along the iliac border two inches into the lumbar region, where, high up between the twelfth rib and the spinal column, there was a point very painful on pressure. The right lumbar region was larger than the left.

Operation October 25th. The patient was not collapsed. Pulse 100, strong; temperature 100°. On the introduction of an aspirator needle into the lumbar region below the twelfth rib fetid, fecal pus was found at a depth of less than an inch. A curvilinear incision, three inches long, was now made over the seat of the dulness and tumor, extending from one inch from the anterior superior iliac spine upward and backward. Upon division of the abdominal muscles and separation of the peritoneum from the pelvic wall, there was an escape of about half a pint of fetid, fecal pus and a large slough of loose, dead, gangrenous tissue from a large cavity which extended up along the colon. The appendix could neither be seen nor felt. A counter-opening was made, on the point of a dressing forceps, in the postrenal region close to the twelfth rib, and a large drainage tube passed through. The patient died in forty hours after the operation. No autopsy could be obtained.

Case VIII.—Woman, 35 years of age; had an abscess apparently localized exterior to cecum, with high fever and vomiting. At the request of Dr. Schirmer, of this city, I operated, making a curvilinear incision. The distended cecum was emptied by incision and the abscess cavity drained. The patient died in twenty-four hours.

Case IX.—Man, 45 years of age; was seen by me in consultation with Dr. Gudden, of Oshkosh. He had been ill two weeks and had apparently a localized accumulation. The symptoms increased slowly, and so a curvilinear lumbar incision was made, through which feculent pus was evacuated. The cavity was irrigated and drained. From the time of operation symptoms of general peritonitis became more pronounced, and the patient died in about twenty-four hours.

CASE X.—Man, about 60 years of age, a patient of Dr. Bluthardt, of Chicago. I operated, in the second week of the disease, for a localized swelling in left iliac region. Upon incision over the tumor a large cavity was opened, which extended over into the right iliac region near the cecum, where a counter-opening was made and the cavity washed out and drained. The patient died.

CASE XI. *Perforating appendicitis; gradual onset of symptoms of appendicitis; operation on sixth day; diffuse dry peritonitis; no fecal extravasation; extirpation of appendix; death after three days.*—Miss M. E. R., 40 years of age. Previously healthy excepting constipation. Menstruation always regular. March 21st, 1893, she was in Joliet and drove home, a drive of two hours; she felt tired, but was otherwise well. The next day she had a headache in the morning, but was not confined to bed. In the afternoon she had pain in the right iliac region; she took an enema, the passage from which was attended by considerable pain. March 23d the pain still continued, and she was obliged to lie down a portion of the day. Next day Dr. Brennon was called in. The patient's temperature was 101°, pulse 100; no tympanites, no vomiting, but she felt nauseated, and there was tenderness on pressure in the right iliac region. March 25th she was in the same condition, but had some tympanites in the right iliac fossa. Enema was twice administered with no effect. The pain was continuous, but not so severe as the initial paroxysm. No vomiting, but regurgitation and spitting. Temperature 101°, pulse 100. March 26th patient began to vomit in the afternoon, and the tympanites increased. She had two enemata, attended by no pain; but considerable pain whenever she was not under the influence of morphine. No flatus passed except during or after enemata. March 27th vomiting of bilious matter, increased to once every two hours. Temperature 98.6°, pulse 120; increased tympanites. Two enemata were given. The patient slept for an hour at a time. She had pain when she moved in bed. March 28th she had vomited at 2 and 9 A.M., just after an enema. I saw the patient at 3 P.M. On examination I found her thin; no facies peritonitica; mouth dry from morphine; tongue coated; temperature 100.2°, pulse 120. She vomited all she took; complained of no pain when under the influence of morphiné. Urine normal. The abdomen was moderately tympanitic; only slight tenderness on pressure,

as I could press my fingers down two inches without causing much pain. No area of dulness could be found, no swelling nor tumor, and only a slight elastic resistance in right iliac region. Vaginal and rectal examination negative. Patient stated that she felt less uncomfortable, but weaker, than on the previous day. She had never had a similar attack of sickness. Diagnosis, appendicitis with spreading peritonitis or intestinal obstruction located in right inguinal region.

Operation March 28th, 1893. A median incision was made three inches below the umbilicus. The peritoneum was very slightly injected. A dry, fibrinous exudate was found on the intertangential lines of the loops of small intestine, which were moderately dilated. The peritoneum was now united to the skin. Not a drop of liquid exudate could be found upon the intestines or in Douglas' fossa. No odor was perceptible. Diagnosis, diffuse dry peritonitis. The appendix could not be found until the wound had been extended up to the umbilicus; it



FIG. 3 (Case 11).

could then be felt against, and slightly adherent to, the posterior outer wall of the cecum. The adhesions were easily broken up and the cecum and appendix brought into view. A large perforation opening was found in the middle of the dorsum of the appendix. (See Fig. 3.) A transverse incision was now made perpendicular to the first incision, in the direction of the right anterior superior iliac spine.

No liquid exudate could be found around the cecum and appendix nor in the right iliac fossa. Upon loosening the appendix there was slight hemorrhage, but the fluid was odorless. The mesenteriolum was now ligated in three portions; this procedure was rendered difficult by the immobility of the cecum. The appendix was ligated and removed. By careful handling there was no escape of fecal matter or of the contents of the appendix. The appendix was found to contain no stone, but only a little fecal matter. The stump was now cauterized with ninety-five per cent carbolic acid, and a glass drain and gauze packing applied around the cecum and appendix. The longitu-

dinal wound was united with sutures, but the outer half of the transverse incision was left open. The usual dressings were applied. Two days later the patient was in good spirits; wound dressed; very little fluid in drainage tube; no odor; wound looked well. She died the next day.

Remarks.—Among these cases we find all the forms represented, from diffuse peritoneal sepsis down to the more chronic forms. We follow Mikulicz's classification into the following three forms:

(*a*) Acute sepsis with no exudate, and only slight injection of the peritoneum, which is glistening and apparently normal.

(*b*) Less acute septic peritonitis with dry, fibrinous exudate, but no fluid in the peritoneal cavity.

(*c*) Diffuse peritonitis with liquid exudate, bloody or seropurulent; odorless when perforation of the appendix has not occurred, fetid or feculent when perforation has taken place.

It is evident that surgery is powerless against the dry forms of peritonitis; it is only in those rare cases in which there is a liquid exudate to remove or wash out that surgery can be of use. The majority of these cases occur where fecal concretions cause a large perforation with fecal extravasation; but in a smaller number of cases, those of septic lymphangitis in a non-perforated appendix, a diffuse peritonitis results, in which operation is of no avail (as in Case 3).

The mortality following operation for this form of the disease is uniformly high. Mikulicz reports eleven cases with two recoveries, and Sonnenburg nine cases with no recoveries. Of the eleven cases reported by me only one recovered.

As to the time for operating, almost all operators agree that the earliest possible time should be chosen; but, as Lange remarks, "we cannot make the diagnosis early enough to save life by laparatomy, that is, by removal of the appendix. It would seem to require a toxic antidote not yet discovered rather than laparatomy to effect a cure."

It is just as impossible to designate a certain period from the inception of the disease—as, for instance, one to three days—in which operation should of necessity be done, because a number of the fatal cases commence slowly and the symptoms increase gradually. Such symptoms as pulse and temperature furnish an entirely inadequate guide.

As far as I have observed, more importance should be attached

to other symptoms, such as vomiting, tympanites, and a steady increase of the symptoms of peritonitis in the period in which, in benignant cases, we would expect a standstill or a decrease in symptoms.

In some cases the surgeon declines to operate. Körte did this in three cases in which he considered the patient unable to endure the operation.

Lange also advises against operating in the first violent onset of the disease, when the patient is depressed from the sudden septic intoxication, but prefers to wait until he has had time to recuperate somewhat, perhaps on the fifth or sixth day, and then operate. Lange believes that by this method he has saved some patients.

As the acute sepsis and diffuse peritonitis not infrequently occur secondarily, in cases which begin with mild symptoms, as a result of perforation of the appendix or rupture of an abscess into the general peritoneal cavity, and as it is impossible in any given case to foresee this event, I usually give the advice to have all preparations made for laparatomy at short notice. Whenever it is possible I have the patient taken to the hospital for this purpose. The fact that the majority of patients recover without operation is immaterial in this connection.

The operation itself has for its object the removal of the appendix, if possible, and the evacuation of the exudate. Disinfection can hardly be thought of in the peritoneal cavity.

For the removal of the appendix the lateral incision over the cecum is preferable; for removal of exudate, median incision, or both combined, is the method of choice. In rare instances we meet with the form of peritonitis described by Mikulicz under the name of "spreading fibrino-purulent peritonitis," which has so slow a course as to permit of successive incision into separate collections of exudate. In one case he made five incisions in one month and saved his patient. Careful watching of the local symptoms of spreading peritonitis, and cautious evacuation of the collection without disturbing surrounding fresh adhesions, are deemed by Mikulicz essential to success.

2. Localized Purulent Appendicitis; Perityphlitic Abscess.—This form is characterized by its localization and by plastic peritonitis around a smaller or larger area surrounding the appendix. I am unable to enumerate cases of this class, as notes have been taken of special cases only. I meet with four

or five cases a year on the average, and they all terminate in recovery. As the free peritoneal cavity is not opened, the operation is nothing more than an oncotomy, or opening of an abscess.

The circumscribed collection of exudate—the perityphlitic abscess—is difficult to characterize as a separate class of cases, because the limiting wall is at first simply a fibrinous exudate, which later on is gradually transformed into connective tissue. The barrier between the septic focus and the free peritoneal cavity is consequently extremely variable as to firmness and resistance. Furthermore, we are unable, even when we have the exudate before our eyes, to distinguish between a benignant, limiting fibrinous exudate and the dry, fibrinous exudate of diffuse dry peritonitis. Furthermore, we meet with a combination of a liquid exudate around the appendix, and fibrinous exudate further off; and in such cases it is impossible to see during the operation whether or not limitation has taken place—in other words, it is impossible to say where the perityphlitic abscess terminates or the diffuse peritonitis commences. The symptoms and the time from the onset of the disease are not reliable as guides in this direction.

On account of these reasons the diversity of opinion about early and late operating, and about the method of operating, has arisen—that is, whether the abscess shall be evacuated by carefully avoiding the disturbance of the adhesions, or whether the diseased appendix shall be removed irrespective of opening into the free peritoneal cavity.

The typical, well-defined, and well-protected perityphlitic abscess leaves little doubt in this direction. It will be opened where it is most easily accessible. Its location can be reasonably well understood from the anatomical considerations above alluded to. The great majority of perityphlitic abscesses are reached by a curvilinear incision over the cecum, more or less close to the os ileum and Poupart's ligament. A smaller number are reached by a lumbar incision.

When the abscess is situated in the small pelvis and is accessible through the rectum, aspiration or puncture and drainage may be tried from this point. A boy 10 years of age, a patient of Dr. Lewis, of Dubuque, Iowa, presented in the second week of appendicitis a perirectal abscess. By means of an aspirator more than half a pint of feculent pus was removed, and the patient made a speedy and lasting recovery.

Lange reports five cases in which he opened and drained abscesses through the rectum. In two of these cases this procedure was sufficient, but in the other three rectal incision was combined with incision in the usual place.

In rare cases we find the abscess most easily accessible in the umbilical region. In one case, a boy of 16, a patient of Dr. Schirmer, of this city, I made the incision in the umbilical region, where, in a localized swelling, pus was found by Dr. Schirmer by means of the hypodermic needle. Incision and drainage led to permanent recovery.

The abscess was opened in my Case No. 10 by an incision in the left iliac region.

When a tumor or swelling is felt in the region of the cecum the question arises whether or not pus is present, or whether the tumor is due to a non-liquid exudate. To determine this by a probatory aspiration is a very much disputed point. Surgeons, as a rule, condemn the proceeding as of little value and dangerous. Physicians, on the other hand, from their experience in alleviating tympanites, consider aspiration with a fine needle as not at all dangerous. The minute wound through the intestine does not permit the exit of even liquid feces. Ranvers goes so far as to believe that aspiration of part of the pus, even as little as five grammes, is likely to promote absorption of the remainder.

Incision and drainage of perityphlitic abscesses in 119 cases collected by Noyes up to 1882 gave a mortality of 16 per cent. The modern method of operating, inaugurated by Willard Parker—namely, early operation in appendicitis—has led to the now much-debated question of the advisability of early operation. The question of when to operate is also very important and very much debated. The good results from the so-called early operation have brought this question prominently to the front. The mortality from the early operation is not great. Weir had a death in 35 operations; McBurney one in 24; Sonnenburg none in 34, in what he calls simple cases; Murphy two in 12; Bull two in 17; Kraft and Deahna have each eight operations with no deaths.

Prognosis of the Early Operation.—Here come the questions: What is early operating, and when should the operation be done? There is little or no dissent to the advice not to operate at the first acute onset of symptoms, but to wait until these symptoms

subside, usually on the second day or a few days later (Vollert). Ranvers advises that the operation be made if the tumor increases slowly in the first eight days, with or without fever. Treves will not operate until after the fifth or sixth day, or even later. Morton gives the advice not to operate later than the third day if no improvement has taken place since the acute onset of the disease, and says that no surgeon will regret having operated early. Lange holds that in the majority of cases we can incise the abscess at the end of the first or the beginning of the second week without danger, and Thomas Bryan states that in the majority of cases it is the wisest course to delay operation.

Appendicitis is so atypical in its course and presents such an infinite variety of clinical features that a certain time in hours or days cannot be a guide to determine operation (Lange). Joseph Price justly remarks that early operation is not measured by the duration of the disease, but by the time of the duration of severe symptoms.

In the early operation for an as yet localized appendicitis, the important question now arises whether the pus should be evacuated by an extraperitoneal incision or by opening through the free peritoneal cavity. The extraperitoneal incision is without doubt preferable, and the oblique incision close to the ilium will in the majority of cases permit the evacuation without entering the free peritoneal cavity.

Edebohls, after incision through the abdominal wall, entered the free peritoneal cavity, and, finding the abscess more laterally situated, he closed the abdominal wound and incised the abscess inside of the protecting adhesions. Lange, on entering the free peritoneal cavity, found the abscess covered with omentum. He stitched this to the abdominal wall and then opened the abscess through the omentum. Sonnenburg invented his operation in two sections for the same purpose of avoiding evacuation through the free peritoneal cavity.

On the other hand, the cases are steadily accumulating in which collections of pus are opened and drained successfully through the free peritoneal cavity. It seems probable that free incision and packing with iodoform gauze—the Mikulicz drain—have decreased the danger from infection very materially.

The next important consideration is, what shall be done with the appendix? Shall it be removed under all circumstances, or shall it be left when not easily accessible? While in acute sup-

purative peritonitis the appendix is the main source of infection to be feared, and is therefore almost always removed, the case is different in the localized collections in the abscesses, where the evacuation of the pus is the main object.

The fear of relapse from a diseased appendix left *in situ* is small, as relapses are not, on the whole, common. On this account in a typical case of abscess no attention is paid to the appendix.

The cases subjected to early operation, however, occupy the middle ground between the typical abscesses and the acute cases, and therefore in early operating the removal of the appendix is growing more and more in favor. Furthermore, the earlier the operation is done the easier it is to remove the appendix, unless adhesions from former attacks are present.

Sonnenburg advises almost always to extirpate the appendix, even if the peritoneal cavity has to be opened for this purpose. He leaves the appendix only in exceptional cases where it is so firmly buried in old adhesions that its removal would cause an undue prolongation of the operation and materially increase the danger of shock. Morton holds that the appendix should be left only in a small, constantly decreasing number of cases, and for the same reasons as Sonnenburg gave. The majority of more conservative surgeons lay less stress on the removal of the appendix, and limit the cases of removal to those in which the appendix readily presents in the wound and can be easily removed.

The appendix, when found, is treated in the following manner: Although Treves has freed the appendix from its adhesions and left it *in situ*, and although Lawson Tait has opened and drained the appendix, its removal is nowadays universally practised. When buried in adhesions it is loosened by the finger, its mesenteriolum ligated in sections, and the freed appendix is then ligated and cut off close to the cecum. The stump of the appendix is disinfected and, if possible, inverted or pushed in between two folds of the cecal wall, and retained in this position by uniting the folds over it by means of sero-muscular sutures. If a portion of the mesenteriolum is available it is sutured to the cecum over the stump of the appendix. Suturing is often difficult because of the friability of the inflamed peritoneum, on account of which the sutures are liable to tear through and not hold.

Fecal fistula from the ligature cutting through the appendix is very rare, but occasionally this suture will keep a fistula open for months. To avoid this mischance Morton advises that the ends of the ligature be left long enough to hang out of the wound, so that the ligature may be pulled out when it has cut through the appendix. In some cases the appendix has sloughed off close to the cecum, leaving an opening into the latter, which should be closed by Czerny-Lembert sutures.

The removal of the appendix can be effected most easily through a lateral straight or oblique incision over the middle of the cecum. It is difficult and almost impossible to gain access to the appendix from the curvilinear incision close to the ilium. The nearer the incision is to the ilium the less liable, says Bryant, is it to be followed by hernia.

It is advisable in operating for perityphlitis to arrange beforehand whether the appendix is to be extirpated or the abscess to be evacuated. If the appendix is to be extirpated, make a lateral laparatomy incision, go through the free peritoneal cavity, down on the cecum, to the appendix. First open and clean out the abscess cavity. If the aim be to evacuate the abscess, make an incision over it wherever found, with a view to the avoidance of the free peritoneal cavity, and make no attempt to find the appendix. In the majority of late operations I consider this the operation of choice.

3. Relapsing or Intermittent Appendicitis.

Case XII. *Chronic appendicitis with exacerbations; four attacks in eight months; pain in the intervals; extirpation of non-perforated appendix; small chronic abscess around apex of appendix on external surface of cecum; recovery.*—E. L. H., age 7. Family history good. She had whooping cough at the age of 2 and scarlet fever when 5½ years old, but recovered perfectly. From birth she had trouble with her stomach, occasional loss of appetite, vomiting, and evening headache. These attacks followed hard play, and usually lasted for a day or two. The bowels were always regular. In October, 1889, she fell off a tricycle and was in bed for two days. Headache was the principal symptom. In January, 1890, she had another "bilious" attack, with vomiting and fever.

Present illness dates from June, 1890, when she had another so-called bilious attack, but this was accompanied by pain in the ileo-cecal region and tenderness. The attack lasted three days

and was so slight that a physician was not called. Three months later she had a similar attack, with vomiting and violent ileo-cecal pain. In less than twenty-four hours tympanites set in; temperature 103.5°. A diagnosis of acute typhlitis was made and the patient kept in bed under the influence of morphine for three weeks. She was then allowed to get up, but walking caused vomiting and headache. She remained in bed or on a couch until January 5th, 1891. January 6th she had a sudden collapse, from which she recovered in two hours, but continued to run down. In February she had another collapse, which lasted three hours. At this time the physician in charge thought he detected a tumor. Since August, 1890, the child has never been free from pain in the ileo-cecal region. The bowels have been constipated during the entire time, but her appetite has always been good. In January and February, 1891, she passed a great deal of mucus from the bowel, but never passed pus or blood.

She was brought to me in March, 1891. At this time she was emaciated, pale, had tenderness in ileo-cecal region; urine, lungs, and heart normal.

March 15th, 1891, operation. A perpendicular incision six inches long was made on the right side over the cecum, and the peritoneum united to the skin. The cecum was bound down so that it could not be lifted out of the wound. The appendix could not be seen, and the cecum was covered with apparently smooth peritoneum. By pushing the anterior against the posterior wall of the cecum a hard mass an inch and a half long could be felt on the outer side of and behind the cecum. The parietal peritoneum was divided in order to avoid tearing into the cecum. Upon dissecting down toward the indurated territory a small abscess the size of a hazelnut was opened, and half an ounce of yellow, odorless pus escaped. The abscess wall was scraped, and a ring-shaped body, the appendix, could then be felt fixed to the posterior wall of the cecum by short, old connective-tissue adhesions. By careful dissection I succeeded in separating the appendix from the wall of the cecum without opening into the latter. The appendix was then ligated and cut off. The stump of the appendix was buried by pushing it in toward the lumen of the cecum and joining the peritoneum of the cecal wall over it with buried sutures.

The peritoneal cavity was cleansed with sponges and the

cecum covered with a corner of omentum, fixing it around the cecum by silk sutures in order to guard against diffuse peritonitis in case the appendix should reopen. A rubber drain and a strip of iodoform gauze were passed down through the wound and brought out through a counter-opening in the lumbar region near the place of the abscess. (See Fig. 4.)

The wound was closed by separate suturing of the peritoneum, abdominal muscles, fascia between muscles and skin, in order to avoid ventral hernia. Strips of iodoform gauze were passed through the lower corner of wound. The gauze strips were removed on the third day. Recovery. The appendix lay with

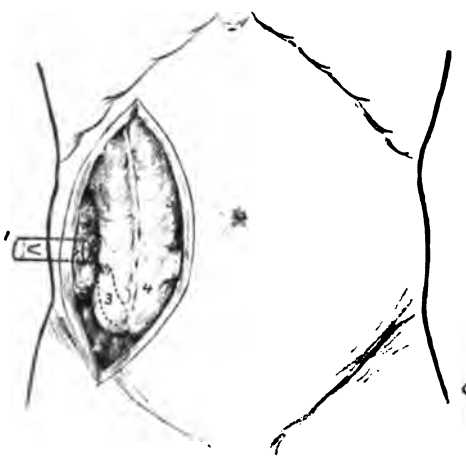


FIG. 4.

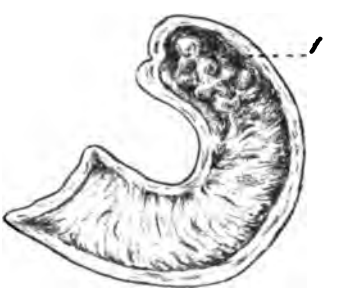


FIG. 5.

FIG. 4 (Case 12).—1, Drainage tube; 2, pericecal abscess; 3, appendix; 4, cecum.

FIG. 5.—Appendix thirty-three millimetres long, ten millimetres in diameter. Not enlarged; contained no fecal matter, but a little mucus. Mucous membrane apparently thickened, but otherwise normal, except at point 1, near the end of the appendix, where the mucosa was irregularly nodulated and red, looking like tuberculous infiltration, but no perforation, and outer wall of appendix looks normal. Microscopical examination: Section through nodulated mucosa at 1 shows epithelium and tubular glands normal, solitary follicles enlarged; in the submucosa, muscular and subperitoneal tissues, small-celled, paravascular infiltration. Section through middle of appendix shows similar condition, but more pronounced, and in addition irregular spaces in the centre of the solitary follicles, possibly miliary abscesses.

its apex, which was curved like a worm, in the abscess cavity; the remainder was buried in adhesions, lay close to the wall of the cecum, and required very careful dissection for its removal.

The appendix was an inch and a quarter long and one-third of an inch in diameter. It was not enlarged and contained no fecal concretion nor body, but only a little non-fecal mucus.

The mucous membrane was somewhat thickened, but was otherwise normal, excepting near the apex, where it was irregularly nodulated, red, and inflamed, resembling a tuberculous infiltration or ulcerated surface. There was no perforation, and the outer wall of the appendix was normal in appearance. (See Fig. 5.)

Microscopic Examination.—A section made through the nodulated mucosa at the apex showed that the epithelium and glands were normal. The solitary follicles were enlarged, and in the submucous, muscular, and subperitoneal tissues there was small-celled, perivascular infiltration—chronic lymphangitis.

Section through the appendix at its middle showed the same condition more pronounced, and in addition irregular spaces in the centre of the lymph glands, solitary follicles—probably miliary abscesses.

Case XIII. *Chronic appendicitis for eighteen months; constant pain, with slight exacerbations and palpable swelling when constipated; removal of perforated appendix, which communicated with cecum through a small abscess cavity; partial resection of wall of cecum; recovery.*—P. L. G., 44 years of age, married; was kindly referred to me by Dr. Winterbotham. Personal and family history good. In April, 1890, he first suffered from pain in the right inguinal region, with fever; no swelling; constipation. He was in bed a week, and since that time he has always complained of pain, more severe when he is constipated. At such times a tumor often appears in the right inguinal region, which disappears when the bowels move.

September 26th, 1891, examination. The patient was pale, but looked healthy. In the right inguinal region, below the middle point of a line drawn from the umbilicus to the anterior superior iliac spine, was a tender, somewhat movable tumor, two or three inches long and half an inch in diameter.

September 28th, operation. A longitudinal incision, ten centimetres in length, was made along the outer border of the rectus muscle over McBurney's point. The muscular band on the cecum could then be seen and the tumor felt through the parietal peritoneum. The peritoneum was opened and united with the wound in the skin. At the lower inner end of the cecum was a hard, nodular mass which was adherent to the ileum and cecum and was covered with a mass of omentum. This was ligated in two portions and divided, and, after separation, the

hard mass was found to be convolutions of the appendix. The apex of the appendix was not dilated, but was considerably thickened for three-quarters of an inch. The middle portion was dilated and ampulliform. The short, firm adhesions to the

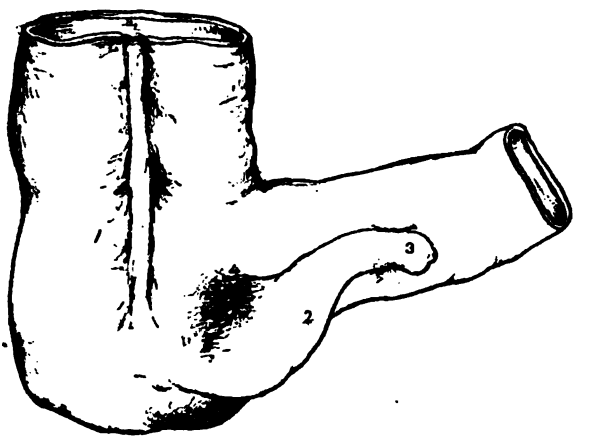


FIG. 6 (Case 13).—1, Cecum; 2, appendix; 3, its apex adherent to cicatrix in wall of ileum; 4, wall of small abscess cavity between the dilated portion of the appendix and the perforation opening into the cecum.

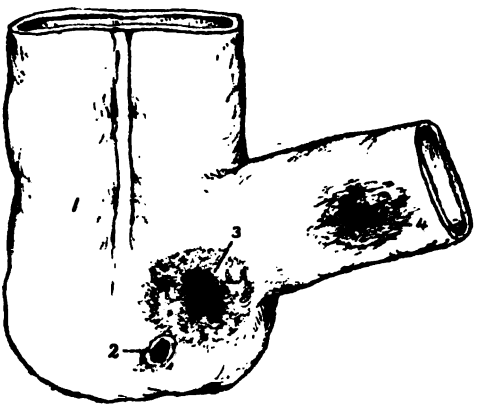


FIG. 7 (Case 13).—1, Cecum; 2, stump of the appendix; 3, perforation opening from abscess cavity into the cecum; 4, cicatrix on the ileum, probably a closed perforation opening.

ileum were loosened and cut with scissors slowly and with difficulty, leaving an area of the ileum an inch in diameter denuded of its serous coat. In the centre of this area was a hard nodule, probably a closed perforation opening into the ileum. (See Figs. 6 and 7.)

Isolation of the ampulliform portion of the appendix was next to impossible. During the attempts at separation some pus escaped. The ileum was washed with sterilized water and all the pus squeezed out from the appendix. Continued attempts at isolation of the appendix revealed a small cavity, from which pus escaped, opening into the cecum and appendix, and located immediately above the cecal end of the latter.

The appendix was now amputated half a centimetre from the cecum; its lumen was patent, but no fecal matter escaped on pressure of cecum. At the point of perforation in the cecum was a thickened mass the size of a hazelnut, which made me believe that a tuberculous ulcer, with thickening of the wall of the cecum, surrounded the opening. I therefore resected this indurated place in the cecal wall. A small amount of mucus and fecal matter escaped, and dark-red folds of mucous membrane protruded. On the introduction of a finger into the cecum it was found that no ulcer existed, but red, injected, swollen folds of mucous membrane surrounded the opening between the appendix and the cecum. A piece of the cecal wall, three-quarters of an inch in diameter, was removed. The wound in the cecum was united with a triple row of sutures: first, mucous sutures; second, Lembert's sero-muscular sutures; and third, serous sutures to bury the Lembert sutures. It would have been impossible to unite the opening in the cecum without resection of the indurated portion of the wall. At the place at which the ileum was adherent to the appendix there was a thickened band showing a red cicatrix in the centre, but no perforation, although no serous surface was left. It was thought inadvisable to invert this territory by means of Lembert sutures, as the patency of the gut would have been endangered, and it was therefore covered with an omental flap (Senn). The omentum was also drawn over the wound in the cecum and fixed in position in both these places with fine silk sutures.

The territory was flooded with sterilized water several times during the operation, which occupied about two hours. The intestine was now reposited, the toilet of the peritoneum made, iodoform gauze and glass drains introduced, the wound closed, and the usual dressings applied.

At close of the operation the patient was not collapsed; pulse 90, strong.

The stitches were removed after two weeks, the glass drain

removed on the eighth day, and the gauze taken out little by little at each dressing until in five weeks all had been removed. The patient had no pain.

The appendix was two and a half inches long; the apex had thickened walls and narrow lumen for an inch—that is, the portion which was adherent to the ileum; the proximal portion, an inch and a half in length, was dilated, and the wall two or three times as thick as that of a normal appendix. (See Fig. 8.)

Microscopic examination of the distal end showed the mucosa to be thickened; epithelium present; Lieberkühn's glands normal; large solitary follicles with abscess in centre. There was lymphangitis and diffuse small-celled infiltration through the muscular, and multiple miliary abscesses in the subserous coat.

The dilated proximal end of the appendix, which was filled



FIG. 8 (Case 13).—Appendix sixty-five millimetres long. At apex, wall much thickened for three centimetres, with narrow lumen; the proximal portion, three and a half centimetres long, is dilated. Wall doubly as thick as normal. Microscopical examination: Thickened distal end shows epithelium and tubular glands present. Mucosa thickened and solitary follicles enlarged, with spaces in centre. Diffuse small-celled infiltration through muscularis, lymphangitis; and in the subserosa, besides lymphangitis, multiple miliary abscesses. Proximal end, which was dilated and filled with pus and opened into the abscess communicating with cecum, wall is thinner, but presented the same microscopical appearances as in the thickened apex.

with pus and opened into the abscess communicating with the cecum, had a thinner wall, but presented a microscopic appearance similar to that of the distal end.

CASE XIV. *Relapsing appendicitis; operation between sixth and seventh attacks; base of appendix transformed into abscess cavity communicating with cecum where the wall of the appendix was absent from previous gangrene; second abscess in anterior wall of cecum an inch and a half above base of appendix; openings into cecum sutured; death from sepsis after two weeks.* —Mrs. C., 49 years of age. She had had six attacks of appendicitis, gradually increasing in severity, the last one on January 30th, 1892, at which time I saw her in consultation with Dr.

Pierce. She had fever, swelling the size of an orange and tenderness in the right iliac region, or rather in the region of the appendix, between the umbilicus and the anterior superior iliac spine. I advised her to wait until the attack was over.

She came to my office March 1st. At this time there was little if any tenderness, but by deep pressure I thought I could make out a longitudinal tumor the size of a thumb, slightly movable transversely. This I thought might be an enlarged appendix surrounded by cicatricial tissue.

After the usual preparation I operated upon her on March 16th. A vertical incision four inches long was made over the cecum. The peritoneum was divided and united with the skin. Sponges were introduced to keep the small intestines out of the field of operation. In the lower end of the wound the anterior wall of the cecum was found to be adherent to the parietal peritoneum, or rather to a hard mass of tissue between the cecum and the anterior wall. Close to this an oval body, which was supposed to be the appendix, could be felt.

The incision was now prolonged downward two inches near to Poupart's ligament, in order to gain space sufficient to isolate the appendix, whose apex and mesenteriolum for a distance of an inch and a quarter were free. At its base the appendix was embedded in a mass of cicatricial tissue the size of a walnut, which was adherent to the anterior abdominal wall. In the attempt to separate this tissue from the parietal peritoneum a small abscess cavity in the mass of adhesions or cicatricial tissue surrounding the base of the appendix was opened and a little thin, yellow pus escaped. The appendix could not be followed to the wall of the cecum, but was lost in a mass of soft granulation tissue on the wall of the abscess cavity close to the cecum. At this point the mucosa and muscularis ceased abruptly, the result of sloughing. (See Fig. 9.)

The mesenteriolum, which was normal, was ligated close to the appendix and the appendix removed. The abscess wall was scraped off from the cecum around the entrance to the appendix. About half a square inch of the abscess wall was adherent to the abdominal wall. The entrance of the appendix into the cecum was now scraped and cut off on a plane with the wall of the cecum. A probe was passed easily two inches down into the cecum, but no gas escaped.

The entrance of the appendix into the cecum was then closed

by sutures through the mucous and muscular coats, Czerny-Lembert sutures, and covered by the mesenteriolum of the appendix fixed by sutures.

An inch and a half above this abscess, on the anterior, outer, lateral surface of the cecum, or the beginning of the ascending colon, another mass of cicatricial tissue the size of a hazelnut was found between the intestines and the abdominal wall. This was excised from the abdominal wall—that is, the transversalis fascia was excised with it. It was impossible to separate this mass from the wall of the cecum. In the centre of the mass were found islands of thick, yellow, inspissated pus, one of which extended into the wall of the cecum. This was the point of perforation of the abscess into the cecum, and was surrounded by firm cicatricial tissue. This inspissated pus focus was removed, and with it the corresponding portion of the cecal

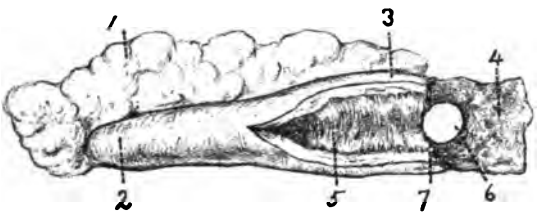


FIG. 9 (Case 14).—Appendix three and a half centimetres long, from apex to point where wall ceases, and one centimetre of abscess cavity with perforation and absence of wall between this point and wall of cecum. 1, Mesentery, adipose tissue; 2, obliterated distal end of appendix, one and a half centimetres long; wall here looks normal; 3, open portion of appendix, two centimetres long; 4, abscess wall, granulation surface one centimetre long where wall of appendix is absent; 5, mucous membrane in non-obliterated portion of appendix looks normal; 6, perforation opening; 7, line where wall of appendix disappears, representing the line of demarcation of circular gangrene of wall of appendix. Microscopical examination of wall of appendix shows lymphangitis and miliary abscesses in subperitoneal tissue. Mucosa in middle portion thickened, but has epithelium and tubular glands.

wall, which left a wound half an inch long in the cecum, from which normal mucous membrane protruded.

The wound in the cecum was closed by Czerny fine silk sutures through the mucous and muscular coats, then a continuous row of Lembert sutures, and finally an outer row of serous sutures. The sutured wound was an inch and a half long, and was continuous with the sutures of the entrance of the appendix and with those of the lower abscess.

The cecum now presented the following appearance: On its anterior outer surface there was a line of sutures two inches and a half long, extending from the apex up to an inch above the

ileum. The cecum was somewhat narrowed, but was still almost an inch and a half in diameter. The ileum was almost empty. The line of suture passed an inch to the left of the entrance of the ileum in order to avoid the ileo-cecal valve. At the upper end of the line of sutures—that is, the upper abscess—the ascending colon was of normal calibre. Gas was now seen to pass freely from the ileum into the cecum and ascending colon, and the passage was thus shown to be free. The abdomen was now cleansed, the cecum mopped off with bichloride solution on gauze; no irrigation. The peritoneum was separately sutured. It was difficult to bring the edges of the wound together, on account of the loss of substance in the site of the two abscesses.

A gauze drain was placed upon the sutured cecum and passed out through the wound. The rectus fascia was united with buried sutures. A gauze drain was introduced into the upper end of the wound, and the external wound closed by step sutures down to the gauze drain.

On the second day the temperature began to rise; no symptoms of peritonitis, but symptoms of increasing sepsis necessitated the reopening of the wound on the third day. Septic inflammation, with purulent and fibrinous exudate, was found in the abdominal wound and on the cecum below. The sutures in the cecum did not open at all, as evidences of fecal fistula never were found. Opening and disinfecting the septic wound was of no avail. On the fourth day the patient became delirious, and died two weeks later. No autopsy was permitted.

Remarks.—As a separate clinical form of appendicitis, with special indications for, and method of, operating, recurrent appendicitis has come into prominence since 1889, when Treves first operated for this condition. At this time more than forty operations of this kind are on record (Kümmel).

This form derives its name from its clinical feature of recurrent attacks with free intervals. The frequency of the attacks varies from two or three a year to one a month, or even more frequently. In the cases with frequent attacks there are usually some pain and inconvenience during the free interval. The attacks may be so slight and the local disturbance so constant that such cases are better spoken of as cases of chronic appendicitis or perityphlitis with slight exacerbation of the symptoms occurring very frequently, every week for instance, or, as in Case 13, every time the patient became constipated.

The pathology of this form is different in extent only from that of the other two forms. We find in and around the appendix all the pathological conditions above described—the catarrhal endo-appendicitis, with or without ulcers, perforations, fecal concretions, lymphangitis and perilymphangitis, periappendicitic abscess, and perforation openings into the cecum.

Iversen has called especial attention to stenosis as a cause of the recurrent attacks. A stenosis at the cecal orifice or at Gerlach's valve may cause dilatation of the entire appendix (Senn, Högh). Stenosis in other parts of the appendix, the middle for instance, may cause dilatation of the distal portion. Strictures are frequent—in five out of eight cases (Kümmel). Perforation is very common, single or multiple openings often situated just behind the stricture, or, more rarely, in the territory of a fecal concretion. Perforation was reported in six out of eight cases. The perforation opening leads out into a small abscess cavity, which again may open into the cecum. Or else there is no abscess cavity, but a direct communication between the two in this place, united by adhesions. Small abscesses may not communicate either with the cecum or appendix, but may be in close proximity to both of them, or may be located in the very wall of the cecum, as in my Case 13. Miliary microscopic abscesses may occur in the subserosa of the appendix, as in my Case 12.

A closed perforation opening into the cecum is seen as a localized thickening of the wall of the cecum, with retraction and folding of the mucous membrane. Stenosis or stricture of the cecum is rare. It has been seen by Kümmel and Lange. Ulcers are also of rare occurrence.

Prognosis.—Spontaneous recovery after several attacks is not uncommon (Pepper, Bryant, Lange); hence the advice of some surgeons not to be too hasty in operating in all cases. But it must be borne in mind that the more frequent the attacks, and the less free the intervals or the nearer the disease approaches to chronic appendicitis with exacerbations, the more urgently is operative interference indicated. Spontaneous recovery takes a long time—in three cases reported by Leiden, from six months to a year. In one of Körte's cases the patient was in bed for nine months. The operation, when successful, gives perfect recovery in a month or two.

The prognosis of the operation is, on the whole, very favorable. Eleven cases were operated upon prior to March, 1891,

and were reported by Iversen. All of these recovered (Treves, Senn, Högh, Kümmel, Malthe, Teale, Iversen). Kümmel lately reported twelve operations in which he did not lose a patient. But, difficult as the operation sometimes is, fatal cases are occasionally met with. In one of my three cases the patient died. Lange also alludes to the loss of one patient, operator unknown. I should consider the mortality of the operation as about five per cent.

Operation.—Most operators agree that the operation should be performed during the free interval between the attacks. The only dissentient opinion in this matter was expressed by Morton, who advises to wait for the next attack, which may not come, on the ground that the operation in the interval may be made difficult and dangerous by dense adhesions around the appendix.

The plan of operating in intermittent appendicitis is simple—namely, removal of the diseased appendix. Simple loosening of the adhesions (Treves) or opening and drainage of the appendix (Lawson Tait) are deemed insufficient.

The necessity of the removal of the appendix is well illustrated in a case reported by Lange, who during a laparatomy found a narrow, retracted cecum, on which he made the Heinecke-Mikulicz operation to relieve the constriction. He did not remove the appendix. The operation had no apparent effect upon the symptoms. At a later laparatomy the appendix, which contained a fecal concretion, was extirpated, and the patient recovered completely. On the other hand, there are cases in which the symptoms are caused by a small abscess, after the removal of which the patient is cured, even if the appendix is not removed, as in a case reported by Lange.

The operation may be very easy or extremely difficult. It is easy in catarrhal appendicitis with no adhesions (Senn's case), but this case was exceptional. Usually the removal of the appendix is more or less difficult, and is complicated by adhesions, abscesses, perforations into the cecum, etc. In rare instances it is extremely difficult and dangerous. In one of Kümmel's cases, in which stenosis of the cecum was found, he was obliged to resort to resection and implantation of the ileum into the ascending colon. Morton speaks of several instances in which some of the best operators have been obliged to abandon the operation in the interval because the appendix could not be found.

The technique of the operation is simple as to its general plan, but variable and difficult in detail. A direct perpendicular or oblique incision should be made over the cecum and into the peritoneal cavity. The adherent omentum on the anterior abdominal wall is carefully removed from the cecum. The appendix is now sought for; it is usually felt as a small tumor around or behind the cecum. The loosening of the appendix with the finger nail or instruments must be done with the utmost care to avoid injuring the wall of the cecum. When the appendix has been loosened throughout its entire extent the mesenteriolum, if not torn during the previous manipulations, is ligatured in portions. The freed appendix is now ligated, cut off, and invaginated. The stump may, after disinfection, be inverted and buried between two folds of the cecum, or the mesenteriolum may be used as a covering. The territory may in addition be covered by an omental flap. Some operators regard the last-named precautions as of little importance.

Openings into the cecum should be united by Czerny-Lembert sutures. This procedure may sometimes have to be preceded by resection of the thickened cecal wall. Through the resection opening the cecum may be explored with the finger for ulcers and strictures, which can then receive the proper consideration and treatment.

Drainage will be necessary in the majority of the cases, and it is exceptional that a case of catarrhal appendicitis without adhesions is met with in which drainage could be dispensed with. Senn and Högh had each a case of this kind. Drainage is usually effected by gauze or drainage tubes, or a combination of the two. The abdominal wound is usually united by step sutures down to the point of drainage, in order to avoid hernia. Iversen and others advocate the employment of Trendelenburg's position.

On the whole, it may be said that the removal of the appendix in the free interval of intermittent and in chronic appendicitis is satisfactory, and, although sometimes very difficult, is in general a comparatively safe operation.

5. Post-appendicitic Conditions, or late Consequences following Appendicitis.—This condition is illustrated by the following two cases:

Case XV. *Chronic perityphlitic abscess of four years' standing, reaching from the kidney down to four inches below*

Poupart's ligament; several compartments communicating with narrow tracts; walls half an inch thick, and dilatation of subcutaneous veins and hardness of swelling simulating malignant tumor; after removal of two fecal stones, definite closure of cavity.—J. E. H., farmer, age 32, was admitted to Emergency Hospital, in my service, June 27th, 1892. Family history good. Previous health good. Present illness dated from the autumn of 1888, when he was suddenly seized, while working in the harvest field, with acute pain in the right side of the abdomen. A year ago he had another sudden attack of pain in right iliac region, and a month later an abscess, which was incised, with escape of fetid pus, and left a fistula in the right lumbar region which still remains open. At present the discharge through the fistula is free for two weeks and the tumor decreases; then the discharge lessens and the swelling increases in size.

Examination.—The patient was strong, fairly well nourished, pale; heart, lungs, and urine normal. In the right iliac region there was a hard tumor extending from the false ribs down to Poupart's ligament, a distance of four and a half inches, and which entirely filled the lumbar region from the twelfth rib to the crest of the ilium, and extended forward to the outer border of the rectus muscle. It was six inches in transverse diameter and took in the outer half of Poupart's ligament; at its medial border at this point the external iliac artery could be felt. The swelling was hard like wood, with no soft places, no fluctuation, no tenderness on pressure. In the lumbar region it was covered by dilated veins, resembling in this regard a malignant tumor. In the upper part of the lumbar region, an inch below the twelfth rib, close to the lumbo-dorsalis and erector spinæ muscles, there was a fistulous opening forming a crater-shaped depression surrounded by nodules of cicatrized granulations, in the centre of which a minute opening could be seen through which a common probe could be passed. The probe passed in transversely toward the median line for four or five inches and could not be moved about in any cavity.

Diagnosis.—Appendicitic abscess. The abscess was located on the outer side of the colon and extended along the lateral aspect of the cecum, then ascending toward the liver.

Operation.—The patient was placed on the left side in the position for lumbar nephrotomy. The incision was made through the fistulous opening from the upper corner of Petit's triangle

downward and forward toward the crest of the ilium. When the internal oblique muscle had been cut through, a layer of hard, white, fibrous connective tissue, half an inch thick, was reached. This was divided first in the region of the fistula, in order to permit digital exploration, which revealed a flat space lying between the anterior abdominal wall and the cecum and ascending colon. The abdominal wall and the cicatricial tissue were now divided down to the crest of the ilium. The cavity was three inches long and lined with a layer of flabby, grayish, red granulation tissue, which was removed with the sharp spoon. This cavity extended down to the anterior superior spine of the ilium. On the posterior wall of the cavity, near the iliac crest, a sinus was found which led down in the iliac fossa close to the bone, which was not denuded, and through which a probe could be passed down to the outer half of Poupart's ligament.

The fibrous wall, a quarter of an inch in thickness, between the two cavities, was now divided with a knife close to the crest of the ilium. The wall was probably the transversalis fascia or the transversalis muscle. The division was continued downward to the outer half of Poupart's ligament, about an inch external to the pulsating iliac artery.

The sinus was denuded of its flabby granulation-tissue layer. At its lower end an extension was found, through which a probe passed easily downward and inward, four inches below Poupart's ligament, along the femoral vessels. Careful curetting of the sinus wall below Poupart's ligament revealed granulation tissue.

The upper portion of the cavity extended upward under the twelfth and eleventh ribs, and inward to the lower surface of the liver three inches above and internal to the lower border of the twelfth rib. The sinus wall was curetted for a distance of four inches toward the vertebral column.

While the cavity was being irrigated a smooth, hard, ovate fecal stone or concretion, an inch long and a quarter of an inch in diameter, and having a fecal odor, was washed out.

The wound and cavities were treated in the following manner: A drain a quarter of an inch in diameter was passed down into the sinus leading to the femur for a distance of four or five inches. A second drainage tube was passed up behind or below the ribs toward the liver. The remainder of the cavity was packed with iodoform gauze, over which a bridge of skin and abdominal muscles was drawn together at the upper anterior

extremity of the crest of the ilium, leaving the upper and lower ends of the wound open for packing. He recovered after two months. A month later another fecal stone was washed out, and in another month the cavity closed.

CASE XVI.—*Constriction of ascending colon by a ring in the adherent omentum after appendicitis and peritonitis ten years before; appendix adherent; median laparatomy with additional transverse incision; division of omentum; extirpation of appendix; recovery.*—Mrs. M., 34 years of age, no children, was referred to me by Dr. Burwash in September, 1892. Ten years ago she had an attack of appendicitis and was in the hospital for eighteen weeks. Two years later she had another attack, and after this an attack every year. In March, 1892, she consulted Dr. Burwash for the pain. He made a diagnosis of constriction of the colon following an old appendicitis. She has been constipated ever since she had appendicitis, and the bowels now move only when physic is taken. If the bowels do not move for two days the patient has pain in the right hypochondrium and cecal region, and when the bowel is empty she experiences a burning sensation in the right half of the abdomen. She has employed large enemata for four years, without relief save the temporary respite when the warm water is injected. She has a feeling of pressure in the cecum when she eats, when she bends down, and when she rises up again.

The trouble seems to be increasing year by year. The patient has taken eleven Ayer's pills, then large enemata, to effect evacuation of old, hard scybala. If she neglects the bowels for five or six days she has ptomaine intoxication.

Diagnosis.—Contracture of cecum, or peritonitic bands around cecum after appendicitis.

Operation November 29th, 1892. The patient's bowels were empty; neither tumor nor appendix could be felt. A median incision seven inches in length was made from four inches below the umbilicus to two inches above. The peritoneum was united to the skin. The omentum presented in the wound, also loops of small intestine with adherent omental shreds, and above this the transverse colon and stomach; the latter was reddish and injected, but normal. The omentum was adherent to the right border of the abdominal cavity and covered the cecum and ascending colon. In order to get space for operating it was necessary to make a transverse incision three and a half inches

long, extending from the first incision at a point an inch below the umbilicus outward to near the anterior superior iliac spine. This exposed the entire right half of the abdominal cavity to view. In the upper portion of the exposed area, below the stomach, which was held up by a flat sponge, could be seen the transverse colon, from the left to near the right upper corner, where it disappeared in an opening or ring in the omentum. The omentum was drawn over the cecum and ascending colon to the abdominal wall in front of them, and adherent to the wall throughout its entire length down to the middle of Poupart's ligament. The cecum and ascending colon could not be seen, nor could the adherent omentum covering them be dislodged.

At the upper border of the omentum, where it passed from the transverse colon over the ascending colon to the right abdominal wall, there was a ring, an inch in diameter, having an upper free border. It was a band, or rather a cord, of omentum extending from the abdominal wall to the ascending mesocolon. The ring easily admitted one finger. The surface of the intestine was not adherent to the ring. The finger could be easily passed down through the ring into a space in the free peritoneal cavity between the posterior surface of the adherent omentum and the ascending colon and cecum.

The omentum was lifted on the finger and ligated in portions for a distance of four inches over the ascending colon and cecum. The omentum was divided in portions between double ligatures, from the colon near the upper end down to the middle of Poupart's ligament below the cecum. The medial portion, or border of the omentum, was attached to loops of small intestine.

After division of the omentum the normal ascending colon could be seen. The cecum was normal on its anterior surface, and quite movable. On turning the cecum to the medial side, it was seen that the appendix was stretched out over the posterior and up on the outer border of the cecum, and bound to it with, or buried in, adhesions so thin that the appendix was plainly to be seen throughout its entire extent.

The appendix was seven centimetres long and flattened, but was otherwise normal. I resolved to loosen and remove it, as it was not obliterated (Behring), and as it was buried in adhesions, the results of the former attacks of perityphlitis mentioned in the history.

The appendix was removed. The mesenteriolum was found to be folded against the cecum and buried in the adhesions. The appendix was loosened from the cecum by blunt dissection; it was most firmly adherent at its distal end. The appendix was now ligated close to its entrance into the cecum, the mucosa cut out on the distal side of the ligature, the stump disinfected with strong carbolic acid, and the peritoneum united over the end of the stump.

The stump of the appendix was buried by means of Lembert sutures passed through the cecum and its mesentery.

The intestine was now freely movable. The right half of the abdominal cavity was irrigated with sterilized water.

The wound was now closed in the usual way, and a Mikulicz drain passed down to the site of the appendix through the lateral corner of the transverse incision. The wounds were dressed. The operation lasted for an hour and a half. At its close the patient's pulse was 110.

The patient remained in the hospital for eight weeks. The wound closed in six weeks. The bowels move more easily since the operation, but the burning sensation still remains.

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ENTEROSTOMY AND DRAINAGE IN THE TREATMENT OF DIFFUSE SEPTIC PERITONITIS.[1]

BY

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I FEEL honored in being invited to participate in this discussion by our Society, and am pleased to be able to say that I coincide in nearly every mooted point with the author, who in his elegant and complete paper has not only outlined all that is at present known concerning this disease, but has also stated his own views in a most convincing though moderate manner.

Discussions of this kind are valuable, in that they corroborate or dissent from the views of the writer, or bring in new facts or methods which may add to the general knowledge of the subject.

The one burning point of discussion among medical men, as, of course, you all know, is the propriety of operating at all upon a given case which has sufficient symptoms to be called a doubtful one. The ground is well taken by the writer when he states: Operate, first, upon all cases accompanied by general or diffuse peritonitis; secondly, operate upon the cases wherever a tumor exists in the region of the appendix, which steadily though slowly increases after the first four or five days of its

[1] Read as part of the discussion before the Gynecological Society of Chicago, following Dr. Fenger's paper on Appendicitis, March 17th, 1893.

discovery; lastly, operate upon the cases that are known as cases of recurrent appendicitis, providing such attacks give signs of gravity.

I might add to this that, where the indications are not sufficiently well marked to be able to classify according to the above standard, everything depends upon the experience of the surgeon who is to operate; for it may be stated almost emphatically that, in appendicitis particularly, the individual experienced in such operations will never increase the danger to life by his work, while the beginner may do incalculable mischief. The same may be said concerning the method of operating; for while such men as Fenger, Senn, McBurney, and others of their experience may feel warranted in loosening all the adhesions and enucleating and resecting the appendix buried in exudate, it were often better for the life at stake that attempts go no further than the opening of the usually present abscess, for we all know that in a very large proportion of cases this comparatively simple proceeding is followed by cure through obliteration of the appending organ.

The particular class of cases about which I desire to speak tonight, however, are the cases accompanied by diffuse peritonitis—those unfortunate cases of which we are accustomed to speak as having come to us too late for operation. Their diagnosis, even if we see them early, is not always easily made. After the first twenty-four hours the right-sided tenderness marking the primary lesion may have disappeared, the general inflammatory condition overshadowing everything, so that it might be questioned whether we are dealing with an appendicitis or not. Particularly is this the case in the female who may have had a previous pelvic inflammation from uterine or tubal disease. Here might be mentioned also a class to be recognized from those having general diffuse peritonitis. I have in operation met two such. In these the exudate was situated to the left as far as the median line; and though, at first sight after incision, the patient seemed to have general diffuse peritonitis, careful exploration revealed a protective wall excluding a large portion of the abdominal cavity from invasion.

Having had a very considerable experience in the surgical treatment of cases of appendicitis, I have come to regard cases of general diffuse peritonitis as offering a difference in prognosis after operation in accordance with the behavior of the origi-

nal lesion. I have come to believe that what might be termed, not correctly but for the sake of convenience, primary diffuse peritonitis—that is, cases where the development of the general inflammation is coincident, or almost so, with the usually present perforation of the appendix—have a moderately fair chance of recovery if operated upon in fairly reasonable season; while the cases of what I call secondary rupture—that is, where the exudation mass formed around an abscess sac ruptures after having been plainly perceptible for a number of days—almost invariably die, no matter how very soon after this secondary rupture the operation is performed. My personal experience extends to five cases of this last variety, while I have observed four additional cases in the practice of my associates. All these nine cases proved fatal, most of them within twelve to twenty-four hours following operation. I suppose the pus being confined within a small cavity communicating or having communicated with the bowel acquires excessive toxic virulence.

I wish to draw your attention particularly to the treatment of the first-mentioned variety—the cases I call, for the sake of convenience, primary diffuse peritonitis. These cases from the beginning present symptoms of the most dangerous character. The experienced physician recognizes these by the extreme rapidity of the pulse, the early dyspnea, the cold extremities, the repeated vomiting, the anxious countenance and rapidly developing meteorism—thirty-six or forty-eight hours—and the patient shows signs of impending dissolution; or, the first onset being apparently passed over, the symptoms continue not quite so acute, and the patient dies, in five to eight days, from sepsis and its resulting paralyzed, tympanitic, distended intestines. I desire to call your attention to two cases which I have managed to save in the last eight months, intending thereby to formulate a method of treatment which may prove of value.

Case I.—L. A., a young girl aged 7 years, was suddenly and without premonition taken with vomiting and various signs of extreme illness. Her physician, a painstaking practitioner of experience, was utterly unable at first to determine the cause. Only moderate fever was present. When he called me at 5 P.M. the second day, after the child had been ill thirty-six hours, he diagnosed peritonitis from the extreme condition, the rapid pulse, the short breathing, and the moderate tympanites then present. The danger being extreme, I operated one hour later,

making an incision in the semilunar line. At 7 P.M. she was returned to her bed. The operation had been hasty on account of the almost imperceptible pulse. The abdomen was completely filled with fluid already containing much pus, while all the visible intestinal coils were more or less covered with plastic exudate. The appendix, easily found, was occluded at its middle by a fecal concretion twice as large as an apple seed. Its distal half was dark, collapsed, and almost gangrenous, while near the extremity was a perforation not quite the diameter of the head of a pin in size. The appendix was hastily ligated near its junction to the cecum and a puckering stitch placed to shut out its lumen, the whole being dropped back into the infected peritoneal cavity. The original incision not having been very large, time being important and drainage necessary, no sutures were taken, iodoform gauze being merely stuffed into the wound and down to the site of the stump of the appendix. The little patient rallied, but the tympanites did not come down materially and she remained in a most dangerous condition for three days. On the third day there was a sudden escape of fecal matter in the dressings, the patient began to improve, the distended bowel came gradually down, and, though fecal matter from the bowel and pus from the abdomen poured out of the common opening for several weeks, she eventually made a complete recovery and is now in perfect health.

CASE II.—A boy 15 years of age was brought into the Alexian Hospital, of which I am surgeon, two months ago, on the fifth day after the development of an acute general peritonitis. He certainly seemed altogether beyond hope. The general symptoms were of the most hopeless character, while the immense, brawny, distended abdomen apparently precluded the possibility of recovery. After much hesitancy I decided to operate, bearing in mind the important lesson gleaned from Case No. 1. I opened the abdomen in the right semilunar line, and there welled out fully one pint of the most offensive greenish-black pus that can well be imagined. The appendix was matted down into an apparently inextricable exudate, and along its side were found two fecal concretions, evidently part of one body before being broken. The cecum on one side and the adjoining coils of ileum were immensely distended, dark in color, and covered with more or less organized lymph. Pushing in a long glass tube, connected with a reservoir filled with hot sterilized

physiological salt solution, to the upper abdomen, I turned my attention to the bowel. Making an incision into the abdominal wall at the side above the anterior superior spine of the ilium and parallel to the cecum, I pushed out a fold of that distended organ and made through its walls an incision about an inch and a quarter in length, the edges of which incision I stitched to the abdominal wall, thereby making a large artificial anus at that point. As soon as opened the cecum began to discharge gas and fecal matter; and now, passing in a large rubber tube upward in the course of the ascending colon, I practised a thorough lavage of the colon. Meanwhile the abdomen from the more median incision had been constantly undergoing a flushing process. After ten or fifteen minutes more of this combined washing out the boy was put to bed, care meanwhile having been taken to introduce iodoform gauze strips to the left side, down into the pelvis, and particularly down into the region of the appendix and around the recently constructed artificial anus. The first twenty-four hours the meteorism was reduced to one-half, and in three days his belly was almost flat. He rallied from the first, and, though his artificial anus has not yet entirely closed, he is practically well, his bowels moving in their natural channel and there being fecal escape from the wound only at intervals of usually two or three days. (Entirely recovered since.)

I believe the course pursued was the means of saving the boy's life, and I present this procedure for your consideration, hoping it may meet with your approbation and may be given a trial. Of course, as you can recognize, it is applicable to all diseases wherein diffuse general peritonitis is the pathological condition, whether due to appendicitis or any other of the many causes of abdominal sepsis; particularly so may it prove valuable when intestinal obstruction is a cause or a complication. In these cases those of us who have had much experience know that, though the obstruction or strangulation be relieved, the bowel remains distended from paralysis, and all authorities agree that to close the abdomen forcibly over distended bowel almost always fails. Again, I know full well that all authorities agree that it is proper to open the intestines and relieve the distention. I do not propose to give a long dissertation on authorities regarding this point; all I desire to say is that some advise opening the bowel by trocar or hollow needle

or incision, closing again, or the making of an artificial anus. Greig Smith in his late article[1] shows in his usual thorough and brilliant manner the value of enterostomy in these abdominal conditions. I operated upon these patients before I had read this article of Mr. Greig Smith, but I go further in insisting that in this class of extreme cases both procedures are necessary—an opening into that portion of the bowel that will relieve distention, and another opening, usually median or moderately lateral, according to the original lesion, where the abdominal cavity will drain; for when there has been great distention for any length of time there is also septic peritonitis, and very frequently it happens that though you drain the peritoneum the distention is not relieved, and, *vice versa*, when you open the bowel by enterostomy and an artificial anus, and close the cavity around it, you shut in an infected cavity and the sepsis goes on. If this combined draining of the peritoneum and the bowel is proven of value, of course modifications of technique will be necessary in the different variety of cases. For example, in appendicitis the way I have mentioned is likely to prove the best—that is, the semilunar incision for draining the cavity, the side incision for draining the cecum. This because of the ease in establishing the drain around the appendix or its stump, and from the inside around the line of sutures used in forming the artificial anus; or it may be found in some cases that the opening left after exsection of the appendix may be dilated or enlarged to form the artificial anus with best advantage. I should suppose that in perforating typhoid ulcers a similar mode of procedure might redeem that so far unfortunate operation. In operating in this manner in most of the usual forms of obstruction of the bowels, I should be inclined to make the artificial opening in the ileum above the obstruction, though if the obstruction is relieved the bowel just below might relieve the distention and be more healthy to incise. In these cases, after one to three days, if strangulation had existed, it might be well to detach the newly agglutinated surfaces, inspect the seat of strangulation, see if resection is necessary, and, if everything is well and the distention relieved, the enterostomy might be carefully closed and the gut dropped.

In the management of certain cases of strangulated hernia particularly, it seems to me that this procedure might prove of

[1] British Medical Journal, March 12th, 1892, p. 554.

great value—that is, where the gut is in a condition of doubtful vitality. Some surgeons perform an immediate resection, but this operation under such circumstances is always very serious and opposed by many. Others prefer and recommend the formation of an artificial anus, but their results so far have not been all that could be desired; one reason, I believe, is that when the strangulation has so far advanced as to endanger the integrity of the bowel, the peritoneal cavity has already become infected and needs drainage. The artificial anus drains the bowel, but, as usually performed, closes the general cavity. Besides, this opening the cavity in the vicinity might be useful not only in draining, but also in protecting the under side of the bowel from leaking into the abdomen. If the value of this method becomes established its importance in gynecological and obstetrical practice cannot, of course, be overestimated.

However, I am transgressing; all I desire to emphasize is, that in *severe* general diffuse septic peritonitis with tympanites, from whatever cause, the chances of recovery will be enhanced if two openings are made, one to drain the peritoneal cavity, and the other, an artificial anus, to relieve the distention.

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CHRONIC OÖPHORITIS AND ITS TREATMENT BY ELECTRICITY:

A CLINICAL STUDY.

BY

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As a pathologic entity chronic oöphoritis has been long recognized, but its recognition as a clinical fact is of but comparatively recent demonstration. Long ago Morgagni wrote of the diseases of the tubes and ovaries found on the post-mortem table. Thus in his forty-sixth epistle he says: "If I wished to enumerate all the lesions of the ovaries and oviducts which I have seen in my dissections, this letter would be the longest of all." Yet at that time ovarian disease was not recognized in the living subject. Meigs, writing in 1850, complained that the knowledge of ovarian diseases was vague and indefinite, and that long before they were recognized they were firmly established. In an article appear-

ing in the *British Medical Journal*, June 6th, 1874, page 734, Lawson Tait makes the following remarks: "Concerning chronic inflammation of the ovary but little is to be found in the writings of our authorities in gynecology; and it has only been by the careful grouping of the symptoms of a large number of cases that I have been able to satisfy myself that the condition may be accurately defined and readily diagnosed." Writing as late as 1880, Thomas[1] says: "Our means of diagnosis of ovaritis, both acute and chronic, is, in spite of all the advances alluded to, so elementary and unreliable that the result is discordance of views and uncertainty as to pathology and therapeutics." What Thomas here writes is in great part still true; for although much has been written on tubal diseases and the morbid changes in the ovaries, attention has been directed almost entirely to the surgical aspects of these diseases, nearly to the entire exclusion of the clinical manifestations of chronic oöphoritis. In fact, set articles on this disease as a clinical entity are almost entirely wanting, save as the surgeon views it, and, with the exception of a dissertation by Fontana, I know of no paper of importance which has appeared since the time Prof. Thomas wrote the above-quoted paragraph. This is the more surprising when we know that chronic oöphoritis is of comparatively frequent occurrence and that its recognition is not a difficult matter. It is astonishing what a secondary rôle the description of diseases of the ovaries, excluding cystic degeneration, plays in works on gynecology as compared with those of the uterus; yet of the two the former is far the more important, for it is the ovaries that make the woman, while their diseases cause infinitely more real suffering. Instead of the ovaries being mere appendages of the womb, the reverse is true, and diseases of these organs immediately react upon the uterus, ovarian disease without co-existing uterine trouble being, in my experience, extremely rare; in fact, it may be said never to occur, whereas inflammations, etc., of the uterus do exist frequently with absolutely no involvement of the ovaries. Hence we can readily appreciate the importance of these organs from a clinical standpoint.

Now as regards the actual frequency of chronic oöphoritis. Tilt considered what he calls subacute ovaritis, really the form we are now considering, a common disease. Tait speaks of it as not uncommon, and other authorities express themselves in a

[1] "A Practical Treatise on the Diseases of Women," 5th edition, p. 657.

like strain. The post-mortem room has often shown its great frequency. Thus among 583 women opened at St. George's Hospital from 1841 to 1850, Mr. Pollack found 265 presenting lesions of some part of the genitive apparatus, and of these the ovaries were said to be involved in 116 instances. Excluding from these 51 cases of cystic tumors and 18 of cancerous disease, we have 47 cases in which inflammation, more or less well developed, played an important part—that is, 8.1 per cent of all cases were suffering at the time of death from oöphoritis or its sequelæ; while of those presenting lesions of the genitalia 17.7 per cent showed inflammatory changes in the ovaries. Hennig in 81 dissections found the ovaries diseased 53 times, and of these 7 were instances undoubtedly of inflammatory trouble—that is, 8.1 per cent of all cases, or 13.2 per cent of those where the ovaries were affected, showed the lesions of oöphoritis or peri-oöphoritis. As bearing on this point, the frequency of tubal disease, with which ovarian inflammation is so often conjoined, is interesting. Lewers, among 100 cases in the post-mortem room of the London Hospital examined especially with regard to the presence of tubal diseases, found these organs extensively affected in 17 cases. According to Galabin, in 302 autopsies in Guy's Hospital of women about the age of puberty, only 12 were found to have distention of the tubes, but in 14 others there was chronic inflammatory disease about the Fallopian tubes; thus in 26 instances, or 8.6 per cent, there was disease in or about these parts. The large percentage found by Lewers is explained by the locality of the hospital and the character of the population from which its patients were drawn, and also by the advanced age of the patients examined, 12 of them being aged 40 years or over. We thus see that on the post-mortem table the absolute difference in frequency of occurrence of tubal and ovarian inflammation is not great, taking Galabin's figures as true for Fallopian disease, founded as they are on the largest number of cases, and those of Pollack for ovarian trouble—that is, 8.1 per cent for inflammation of the latter and 8.6 per cent for that of the former.

Such, then, being the frequency of chronic ovarian inflammation at post-mortem, let us inquire how often it is met with clinically. Olshausen believes that but 1.33 per cent (12 times in 900 gynecological cases) of all cases are instances of this disease. This is an extremely low estimate, and one, as we shall

see, undoubtedly far below the truth. Fontana, basing his conclusions upon the examination of 145 cases occurring among 3,054 patients in Frankenhäuser's clinic, finds the disease thus as frequent as 4.75 per cent. No doubt it is impossible in all cases clinically to detect the existence of chronic oöphoritis, the same holding true of tubal diseases; just as it is impossible to always palpate the healthy ovary, some women, as is well known, offering, on account of thick or tense abdominal walls or from other causes, so much obstruction to our manipulations that a conclusion as to the condition of the ovaries becomes a matter of much doubt. Among 5,262 gynecological cases seen during a series of years, careful attention having been devoted to the interrogation of the ovaries of every patient, I have found 289 cases, or 5.49 per cent, suffering either from simple or complicated chronic inflammation of one or both ovaries. Thus it will be observed that relatively oöphoritis is a rather common malady, far more so than Olshausen would lead us to believe, and even more so than Fontana supposes. Symptoms referable to the ovaries are quite frequent in gynecological cases where examination, as far as it can, shows these organs to be healthy; but to my mind it is more than likely that a small percentage of such patients are the subjects of ovarian inflammation. Hence we may estimate chronic oöphoritis to occur in about 6 per cent of all gynecological cases, and not be far from the truth. Among married women it is about three times as common as among single women—a fact not to marvel at when we consider the etiological relations of the disease. Thus, of my 288 cases, 274 were married and but 14 single women. Of the whole number of gynecological patients from whom these cases were drawn, 4,594 were married and 668 single. We therefore have the frequency of the malady at 6 per cent for the married and 2.1 per cent for the single women, a ratio almost exactly of 1 to 3, showing strikingly the importance of marriage as an etiological factor. This great disparity may, however, perhaps be partly explained by the fact that an extremely large percentage of the single women were suffering from amenorrhea, either anemic or climatic, without any actual uterine disease. It seems to be an almost universal opinion that oöphoritis is far more frequent on the left than on the right side. Taking any number of works on gynecology, whether American, English, German, or French, we will find them of one accord, stating that the left side is the side on

which the disease most commonly exists. This supposed great frequency of oöphoritis on the left side has by Tait been compared to varicocele in the male, which notoriously is far more frequent on the left than on the right side. But oöphoritis and varicocele are in no way comparable, in anatomical structure or pathologically. A better comparison would have been orchitis. Of the relative frequency of this affection on the two sides there seems to be some difference of opinion. Curling, a high authority, basing his conclusion on the study of 138 cases, finds the disease oftener on the right than on the left side. Of Fenger's 3,136 collected cases 1,500 were of the right side, 1,425 of the left, and 211 bilateral. On the contrary, Prof. Sigmund among 1,342 cases observed the left testicle to be affected in no less than two-thirds of his cases. The consensus of opinion seems to be that "swelled testicle" usually occurs on the left side. The same is true of other testicular or scrotal affections, though in some forms of disease the difference is very slight—hydrocele, for instance. Contrary to what we have seen is claimed of chronic oöphoritis clinically, I have found the two sides to be involved with about equal frequency, and, if anything, the right slightly more often than the left. Fontana has reached a similar conclusion. Thus, of his 145 cases, 62 or 42.7 per cent were right-sided, 53 or 36.6 per cent left-sided, and 30 or 20.7 per cent involved both ovaries, showing a preponderance of about 6 per cent on the right side. In my own cases—and all conclusions reached in this paper are drawn from the study of 250 histories of patients suffering from undoubted chronic oöphoritis—a result closely approximating to that of Fontana is reached: 42.4 per cent being on the right, 40.8 per cent on the left, and 16.8 per cent bilateral. Here we note a difference of but 1.6 per cent between the two sides. Figures for purposes of comparison between the clinical observation of oöphoritis and other ovarian diseases, or the results found at operation or on post-mortem, are hard to obtain. Taking ovarian cysts, for instance. Of 850 cases examined by Dr. Charles Clay, two-thirds were of the right side. Of 415 cases observed by Chéreau, Lee, Bloff, and Scanzoni, the right ovary alone was affected in 204 instances, the left alone in 149, and both in 50 cases. Thus, of 878 observed clinically, 52.9 per cent were of the right ovary, 36.3 per cent of the left, and 10.8 per cent of both. But, as Peaslee well says, "these observations

were, however, made during life, and it is impossible generally to decide, before opening the abdomen, on which side an ovarian cyst originates, though it is more likely to cross from the left to the right side than the reverse."[1] Tilt, also, out of 475 cases found 260 in the right ovary, 170 in the left, and 45 times double-sided. Of 76 cases observed after death, 26 or 34.2 per cent were right-sided, 23 or 30.3 per cent were on the left, and 27 or 35.5 per cent were on both sides—a slight excess of the right over the left side. Tait extirpated in 101 ovariotomies 28 right-sided cysts, 34 left-sided cysts, and in 27 both ovaries were cystically degenerated. From the foregoing it may safely be concluded that if ovarian cysts be more frequent on one side than another, that side is the right. Now, how are these relations as regards tubal disease? Martin[2] found in 1,000 unpicked patients in his Poliklinik the right tube affected 58 times, the left 138 times, and both 91 times. Winckel mentions 22 cases of salpingitis, of which 6 were in the right, 4 in the left, and 12 involved both tubes. Boldt,[3] reporting the results of 112 salpingo-oöphorectomies, tabulates the fact that in 21 cases the right tube only was removed, 27 times the left, and in 64 instances both tubes required removal. Martin's statistics I conceive to be entirely wrong; for, be one ever so expert a diagnostician, it is hardly likely that tubal disease exists as often as he claims to have diagnosed it—viz., 287 times in 1,000 clinical cases. Taking Lewers' figures, drawn from the post-mortem room, already quoted, as the extreme limit, *i.e.*, 17 per cent—though Galabin's, 8 per cent about, I believe to be much nearer the truth—we see how excessively frequent Martin seems to have found tubal inflammation. For this reason his figures are hardly reliable. However, we must conclude that tubal disease seems to be more common on the left than on the right side, though the actual difference is not great. Chronic oöphoritis is undoubtedly almost equally frequent on the two sides, most authorities to the contrary notwithstanding, as my figures and those of Fontana, already quoted, positively show. Tubal disease, as is well known, rarely exists without coexisting ovarian inflammation, hence what is true of the one should almost necessarily be true of the other; so that if the

[1] "Ovarian Tumors," p. 87.

[2] Zeitschrift für Geburtshülfe und Gynäk., Bd. xiii., Hft. 2.

[3] Medical Record, May 17th, 1890.

former be more common on the one side, the same is more than likely to hold good of the other. If further experience proves that left tubular disease is the most common, our only explanation for the fact that the same is not true of the ovaries must be sought for in the possibility that extension to the right ovary from the tube is more apt to occur than a similar extension along the left tube. Besides, we must remember that many of the cases of oöphoritis exist without any complicating salpingitis. The more frequent existence of the oöphoritis on the right side seems also to be contrary to the usual rule prevailing regarding one-sided gynecological complaints; for, as is known, cellulitis and peritonitis most commonly exist to the left; cervical laceration almost always, when unilateral, involves the left half of the cervix; while of tubal disease this, as we have just seen, is also true. I have dwelt thus long on this question for the reason, as already stated, that, excepting Fontana, it is the universal belief that the disease under discussion is far more common in the left ovary than in its mate, and one authority, simply borrowing from another, has accepted this error as a fact and perpetuated it. Statistics, however, prove otherwise:

	Fontana.		Author.	
	Cases.	Per cent.	Cases.	Per cent.
Right ovary	62	42.7	106	42.4
Left ovary	53	36.6	102	40.8
Both ovaries	30	20.7	42	16.8

showing a remarkably close correspondence in our results.

The causes of chronic oöphoritis naturally range themselves under the two general heads, predisposing and exciting, the former being comparatively easy of determination; the latter being just as difficult to detect as the former are easy, the onset of the disease being usually so slow and insidious that its victim is generally unaware of its existence until it is fully developed, so that even close interrogation will, in quite a large percentage of cases, fail to elicit any decided information respecting the time of beginning and the actual exciting cause of the malady.

Predisposing Causes. *Age.*—Chronic oöphoritis is essentially a disease of adult life. Rarely seen before the age of puberty, it is just as infrequently met with after the menopause,

and then only and always as a remnant of a disease that had already had its existence before menstruation ceased. That it may appear before the menses are established there is no doubt; for, as we shall see later, certain cases of so-called amenorrhea dependent upon undeveloped uterus and ovaries are not really such, but are rather instances of atrophic oöphoritis complicating the infectious diseases of childhood.

The youngest case coming under my notice was 16 years of age, the oldest 49 years, but both were in the menstrual period of life. As the disease had existed for a considerable period in most of my cases, the average duration for all having been about two and a half years before coming under observation, the following table exhibits only the age at the time of presentation for treatment:

	Cases.	Per cent.
15 to 20 years	8	3.2
20 to 25 years	79	31.6
25 to 30 years	76	30.4
30 to 35 years	50	20.0
35 to 40 years	24	9.6
40 to 45 years	10	4.0
45 to 50 years	3	1.2

thus showing the most frequent occurrence of the malady during the period when the genital functions are most actively and violently exercised—that is, during early married life and at the time of most active childbearing.

Social Condition.—Above all things marriage is an important factor in the development of this disease. Of the 250 cases on which the conclusions in this paper are founded, but 12 times did it occur in single women—that is, in only 1 in every 21 cases, or in only 4.8 per cent of all. Even this does not represent the whole truth, for of these 12 single females 2 had already borne children and 6 others were not leading virtuous lives.

Early marriage, possibly before the parts are sufficiently developed to withstand without suffering the assaults of the marital act, is undoubtedly important as a predisposing cause. Thus, of the 238 who were married, 104 had entered the married state before the age of 20 years. This fact of early marriage is rather characteristic of the races from which these cases were

drawn. The earliest marriage among my patients was 14 years, and 210, or 88 per cent, were married by the time they were 24 years of age. Thus the ages at marriage were :

	Cases.	Per cent.
14 years	2	0.8
15 to 20 years	102	42.9
20 to 25 years	108	45.3
25 to 30 years	20	8.4
30 to 35 years	3	1.3
35 to 40 years	3	1.3

To indicate how distinctly this factor manifests itself, a simple comparison with the marriage age in our own city will show this with startling clearness. Thus :

Age.	New York City	Author's.	Difference in favor of oöphoritis.
Under 20 years	25.9 per cent.	43 7 per cent.	17.8 per cent.
20 to 25 years	41.3 "	45.4 "	4.1 "
25 to 30 years	17.4 "	8.3 "	
30 to 35 years	7.2 "	1.3 "	
35 to 40 years	4.5 "	1.3 "	
40 to 45 years	1.9 "		
45 to 50 years	1.1 "		
Over 50 years	0.7 "		

As a striking illustration of the bearings of wedded life on this question, we note the fact that a large percentage of the cases follow comparatively soon after marriage, for of the 238 women there were :

Married 6 months or less	11 cases.	
Married 6 months to 1 year	18 "	
Married 2 years	23 "	
Married 3 years	17 "	
Married 4 years	28 "	
Married 5 years	29 "	= 121 cases, 50.8 per cent.
Married 6 years	18 "	
Married 7 years	18 "	
Married 8 years	21 "	
Married 9 years	11 "	
Married 10 years	8 "	= 71 cases, 29.9 per cent.
Married over 10 years	46 "	= 46 " 19.3 "

This is contrary to the opinion entertained by Fontana, but agrees with that of Duncan and Olshausen.

As further bearing on this point I note the fact that there were 14 of these women who were married for the second time. In preparing the foregoing table, cases of second marriage being included therein, the total period of married life with both husbands was taken. But when we look into the duration of their second marriages a demonstration of the effects of marriage is at once evident. Six were living with the second husband one year or less, 2 others about two years, and still 3 others three years or less, thus giving 11 out of 14 who had entered wedlock a second time who were living thus for three years or less. None of these 14 were married for the first time at a particularly early age, hence this had no bearing on their cases. Whether second marriages offer a special predisposition to the disease, over and beyond the resubmitting for a second time to the consequences of the over-indulgence of early married life, when perhaps the vital powers have lost some of their power of resisting such perturbations of physiological functions, it is difficult to decide. The fact, however, stands that the comparatively large proportion of 5.9 per cent occurred in instances of second marriage, the average age of these cases at first marriage being about 19½ years, at second marriage 29 years. Marriage, according to Tilt, late in life is apt to induce an ovarian inflammation, explaining this occurrence on the ground that the ovaries, having been debarred from their proper stimulus when most needed, become so accustomed to the privation that when such stimulus is at last presented it produces a morbid impression. He also claims that ovaritis may be the consequence of marriage during the menopause, and attempts to explain the profuse hemorrhages so common at this period to the reaction of the diseased ovaries upon the uterus. My experience to a considerable extent coincides with this, for I have met with cases of chronic oöphoritis at this time of life. Thus, of my 250 cases, 13, or 5.2 per cent, occurred after the fortieth year of life, while 2.6 per cent had married after the age of 30 years.

As a necessary corollary of early marriage we have early childbearing; but this holds true only in part in these cases, for oöphoritis undoubtedly has a deterrent effect upon impregnation. Primiparity does not occur here at as early an age as would be expected from the early period of marriage; but still the mothers will be found to have been comparatively young when compared with the generality of primiparæ in our city. Thus the age at the birth of the first child was:

Age.	Oöphoritis.	New York City.	Difference in favor of the former.
Under 20 years	31.2 per cent.	17.8 per cent.	13.4 per cent.
20 to 30 years	67.4 "	62.4 "	5.0 "
30 to 40 years	1.4 "	15.1 "	
40 to 50 years		4.7 "	

showing a slighter difference between the two sets of cases than was shown by the former comparison of the age at marriage of these same cases.

Of the 238 married women 62 had never been pregnant up to the time of coming under observation. Of the 176 fertile women no less than 35, or 19.9 per cent, had begun their child-bearing life with a miscarriage. Compared with other uterine cases this percentage is excessive; for of 2,734 fertile women of whom I have kept notes regarding this point, all of whom presented themselves for the treatment of some genital ailment, only 13.5 per cent had a miscarriage as a first pregnancy. Here we see how violent must have been the perturbation that brought about such a result in cases afterward presenting oöphoritis. No doubt the cause acting to produce this primal miscarriage, reinforced by the evils induced by such an accident, extended onward along the genital tract to bring about the final oöphoritis.

Rapid impregnation after marriage is another predisposing factor, though not strikingly so. Of the 141 women who bore living children at term, in 134 cases the period intervening between marriage and the birth of the child has been noted. Of these 67.2 per cent were delivered within the first year, 26.8 per cent by the end of the second year, and 3 per cent each during the third and fourth years. I have said, not strikingly so, for rapid impregnation is characteristic of the class from whom these patients are drawn. Thus, for comparative purposes and to exemplify this fact, we have the following table showing these relations:

	All cases.	Oöphoritis.
Primiparity during first year	1,447—68.3 per cent.	90—67.2 per cent.
Primiparity during second year	550—26.0 "	36—26.8 "
Primiparity during third year	69— 3.3 "	4— 3.0 "
Primiparity during fourth year	24— 1.1 "	4— 3.0 "
Primiparity during fifth year	12— 0.6 "	
Primiparity during sixth year	5— 0.2 "	
Primiparity during seventh year	8— 0.4 "	
Primiparity during eighth year	8— 0.1 "	

indicating a comparatively close correspondence between the two classes of cases. The same is also true of miscarriage as a termination of a first pregnancy, a similar close correspondence existing. Thus, the time of impregnation, not the time of miscarriage, being here indicated, we have:

	All cases.	Oöphoritis.
During the first year	222—70.3 per cent.	21—67.7 per cent.
During the second year	71—22.5 "	7—22.6 "
During the third year	17— 5.4 "	1— 3 2 "
During the fourth year	2— 0.6 "	2— 6.5 "
During the fifth year	3— 0.9 "	
During the sixth year	1— 0.3 "	

Again, another important point: Of 159 in whom this matter was indicated, in 53, or 33⅓ per cent, the pregnancy preceding the time at which they presented themselves was a miscarriage. This is remarkable when recalling the fact that abortions bear a ratio to full-term labors of 1 to 4.3, these figures being based upon a study of 3,447 gynecological cases.

Frequent occurrence of gravidity cannot be said to influence to any considerable degree the occurrence of oöphoritis. On the contrary, in patients the subjects of this disease impregnation is not very apt to occur, the existence of the malady, together with the usual coexisting uterine complications, preventing conception. Sterility is the rule where the disease has rapidly followed marriage. Where occurring later on in married life childbearing entirely ceases, or if impregnation takes place it is very apt to be abortive, miscarriages being particularly frequent in such cases. There is a double cause for such interrupted pregnancies: the oöphoritis itself produces a diseased ovum, while the uterine lining membrane supplies a diseased nidus for the impregnated ovum; for, as we shall see later on, uterine and ovarian disease coexist in the large majority of cases. These facts are exemplified in the table on page 217.

Coe[1] states that fibrous hyperplasia, really the interstitial variety of chronic oöphoritis, may follow repeated pregnancies; but, as the above seems to indicate, this is an error.

The character of the labors appears to bear some relation to

[1] "American System of Gynecology," vol ii., p. 866.

Duration of marriage.	Total cases.	Nullipara.	Fertile.		
			Average number of pregnancies.	Average number of children.	Average number of abortions.
1 year or less	29	12	0.88	0.35	0.53
2 years	24	7	1.18	0.59	0.59
3 years	17	8	1.78	0.89	0.89
4 years	22	9	1.23	0.85	0.38
5 years	29	10	2.53	1.79	0.74
6 years	19	6	1.92	1.38	0.54
7 years	11	2	2.22	1.56	0.67
8 years	21	3	2 83	2.11	0.72
9 years	11	1	3.20	2.50	0.70
10 years	8	1	3.43	2 71	0.71
11 years	3		2.67	2.33	0.33
12 years	7	1	4.00	2.67	1.33
13 years	6	1	5.60	4.20	1.40
14 years	4		4.75	4.25	0.50
15 years and over	27	1	6.69	5.35	1.35
Total	238	62	2.95	2.18	0 78

the disease. Thus, of the 238 married women, 142 had borne 386 full-time children, and of these the labors were instrumental in 8 instances—that is, an average forceps application of 1 in every 48 cases. Besides, 4 others had given birth to dead children, and a considerable number described their labors as either difficult or tedious.

Exciting Causes.—These are many, but their mode of action will be found to be pretty uniform; frequently repeated or continuous congestions of the parts finally passing over into chronic inflammation, or a simple direct extension of inflammation from some other part of the genital apparatus finally bringing about the disease. A third possible, though doubtful, way in which the disease may be brought about is by metastasis. This was formerly predicated of the oöphoritis following gonorrhea and occurring during the course of a mumps. In gonorrhea we now know the disease to be dependent upon actual extension; in mumps metastasis offers a possible explanation, though the probabilities are that its occurrence here is due to the direct action of the germ of the disease upon the glands themselves.

A. Exciting Causes acting by Producing Congestion of the Ovaries:

(*a*) Sexual excesses.
(*b*) Imperfect sexual relations.
(*c*) Masturbation.
(*d*) Use of aphrodisiacs.
(*e*) Suppression of menses, especially when sudden.
(*f*) Laceration of the cervix uteri.
(*g*) Cervical stenosis.
(*h*) Laceration of the perineum.
(*i*) Subinvolution and areolar hyperplasia.
(*j*) Uterine tumors.
(*k*) Uterine displacement.
(*l*) Prostitution.
(*m*) Unilateral ovarian cystoma.
(*n*) Emotional influences.

(*a*) *Sexual Excesses.*—That this is an important causative agent is shown by the frequent occurrence of the disease soon after marriage, when such a cause is most operative; after second marriage; and its remarkable frequency in prostitutes, more especially the young. As already shown, almost one-third of the cases occurring in married women presented themselves at or before the end of the third year of married life, while in over one-half the disease manifested itself before five years had passed. Besides, 31.3 per cent of the cases traced back the origin of the disease to the time of marriage. The abuse of a physiological function, entailing congestion, was finally paid for by continuous hyperemia of the organs, which ultimately terminated in an insidious, almost unobserved inflammation, whose presence only became known when fully developed. In not a few of these cases absolutely no other explanation for the existence of the disease could be found, there being no signs or history of any other possible cause, such complicating disease as existed being undoubtedly dependent upon a similar origin as the oöphoritis.

(*b*) *Imperfect Sexual Relations*, such as incompatibility, an old husband and a young wife, the practice of conjugal onanism, the avoidance of maternity, etc., producing, as they do, congestion of the ovaries without the subsequent relaxing effect of the normal completion of the marital act, tend to produce the disease in time. Pregnancy and lactation, with the consequent rest of the genital organs, being absent, these causes are more certain to act. The avoidance of impregnation is, in my experience among the better classes, of common occurrence, checks of all kinds being resorted to; and in this fact is to be found a plausible explanation for the frequent existence of uterine, tubal, or ovarian disease among such women. More than once

have I seen women, who in early married life had avoided maternity, who later on, when desirous of bearing children, found impregnation impossible simply and solely because they had a penalty to pay which inexorable Nature demanded of them. And not a few such cases are the victims of chronic oöphoritis.

(*c*) *Masturbation.*—This, in my experience, is not frequently operative. Chronic oöphoritis being rare in the single, except in such as are leading an irregular life, a necessary conclusion must follow that onanism is not a prominent cause of the disease; in fact, so far as my experience goes, it is of very rare occurrence as a cause. In not one of my cases did it seem to act as such.

(*d*) *Use of Aphrodisiacs.*—This is mentioned as a possible cause, but as such agents are of infrequent use, at least in this city, its action is more than problematic. Tilt holds a similar opinion. I have never met with such an instance, nor can I find any recorded in literature.

(*e*) *Suppression of Menstruation.*—We can imagine oöphoritis following a chilling during menstruation with its subsequent sudden suppression, but so far I have never met with such a case and am therefore very sceptical on this point. In one form of the disease, the atrophic or cirrhotic, amenorrhea is symptomatic of the malady, but not causative. However, most authorities refer to it as producing oöphoritis, though facts to prove the connection between the two are wanting. Cold, as a causative factor of uterine or ovarian disease, I have long looked upon with suspicion, and before admitting its powers in the present premises must demand more positive proof than at present exists. Of suppression from other causes the same holds true. In such cases of oöphoritis as have come under my observation coexistent with suppression, the latter was purely symptomatic of the former and never causative.

(*f*) *Cervical Stenosis.*—Stenosis of the cervical canal, either at the external or internal os, was present in such a large number of cases that it is more than probable that some connection exists between them. Of the 238 married women 62 had never been pregnant, and of these no less than 24 were affected with narrowing of the cervical canal, 11 of these latter also presenting the condition so well described by Barnes as conical cervix. The mode of action here is twofold. By the damming back of

secretions endometritis is set up, with final extension along the tubes; or the constant irritation, especially at the menstrual periods, sets up congestion in the ovaries, with ultimate inflammation of these bodies.

(*g*) *Laceration of the Cervix.*—Of the 238 married women coming under my care with chronic oöphoritis, 142 had already borne one or more full-time children, and of these no less than 55 were also affected with laceration of the cervix to a pathological degree—that is, in 38 per cent of all cases in parous women cervical laceration coexists. This cannot be an accidental coexistence, for Goodell has noticed a similar causative relation. Besides, the explanation is a simple one. Laceration induces uterine congestion and subinvolution, with similar interference with the involution of the vagina, ovaries, etc. If continued for a sufficiently long time the uterus itself undergoes a fibroid degeneration, or what is known as areolar hyperplasia; while the ovaries, keeping step with the uterus, undergo a similar change, and thus we have chronic interstitial or fibroid oöphoritis. Besides, as other secondary results of the laceration, we have endometritis chronica with possible extension along the mucous tract to the tubes and finally to the ovaries. We must also bear in mind that the cervical tear offers an avenue for the entrance of septic material with all the evils that it entails, among these ovarian inflammation. Besides, as uterine lymphangitis may thus be set up, and as the connection between the lymphatics of the uterus and ovaries is very intimate, another possible mode of the setting up of ovarian inflammation is to be borne in mind, that is, by the extension of a lymphangitis.

(*h*) *Perineal Laceration.*—The action of this cause is entirely analogous to that of cervical laceration, vaginal and uterine subinvolution with consequent ovarian congestion being the sequela of this accident. It is not as frequently operative, by any means, however, as laceration of the cervix, for it was present with chronic oöphoritis but 8 times; that is, it was found in only 5.6 per cent of all cases of fertile women, as against 38 per cent for cervical tears. It is worthy of remark here that in 9 cases cystocele, rectocele, or cysto-rectocele coexisted with oöphoritis, this being indicative rather, however, of the influence of the various forms of laceration on the involution of the maternal parts. Five times there was cystocele, once rectocele, and

three times cysto-rectocele. These conditions but added fuel to the fire by the constant dragging, increasing the already existing universal congestion.

(*i*) *Subinvolution and Areolar Hyperplasia of the Uterus.*—Areolar hyperplasia, as defined and described by Thomas, is almost always a sequel or end process of subinvolution. It occurs as a pure fibrous degeneration of the uterine walls, and as such indicates the possible termination of ovarian subinvolution with its consequent chronic congestion in a similar interstitial fibrous change. The ovaries during pregnancy, according to Jacquemier, increase in volume twofold, assume a vertical direction, are drawn closer to the body of the uterus, and rise with it. According to Henning the puerperal ovary is largest during the six weeks after labor. We can understand, therefore, the coincident occurrence of ovarian subinvolution with subinvolution of the uterus, the reaction of the one on the other producing a vicious circle, which in time brings about what in reality amounts to a low form of chronic interstitial inflammation. Just so we see subinvolution of the vagina and also of the perineum, as indicated by laxness and looseness of the former with tendency to prolapsus; or as shown by gaping of the vulval opening, with relaxation and inelasticity of the circumvulval soft tissues of the latter, so often coexisting with uterine subinvolution. All these are but parts of a general process, and it is easily conceivable that similar conditions may coexist in the ovaries, which in time, as in the case of the uterus, may pass over into a state of chronic hyperplasia. As a matter of fact, uterine subinvolution existed in 16 of my cases, while areolar hyperplasia, undoubtedly dependent upon a pre-existing subinvolution, was present in no less than 28 other cases. Thus we have 44 cases in which these conditions were operative in the production of a chronic oöphoritis, for in every one of these the patients traced their troubles back to a previous labor at term or to a miscarriage. In fact, no less than 40.7 per cent of all cases dated their illness back to a pregnancy, either interrupted or completed.

(*j*) *Uterine Tumors.*—Eastman[1] believes that diseased ovaries and tubes stand in important causative relations to uterine fibroids. Popoff[2] proves such to be a fact; for in 20 cases where

[1] Indiana Medical Journal, April, 1890.

[2] "Inaugural Dissertation," No. 55, St. Petersburg.

the ovaries were removed for the relief of fibromata, he found invariably a hyperplasia of the connective tissue, with corresponding enlargement of the organs, the principal effects being cortical. He considers these morbid changes in the ovaries as dependent upon prolonged congestion resulting from the presence of the fibroid. In a further communication[1] he sums up the ovarian changes as follows: 1. In fibromyomata of the uterus the ovaries are almost always the subject of more or less extensive changes, including the tunica albuginea, the interstitial tissue, and the follicles. 2. Changes in the interstitial tissue are most frequently observed, being always manifested by proliferation of the connective tissue, with increase in the volume of the ovary. 3. This interstitial process appears to extend uniformly along the length of the entire cortical layer, or it may involve only small portions of the organ. It may involve only vessels and nerves at the periphery, and appear as a thickening of the vascular walls with obliteration of the lumen of the vessels, together with thickening of the peritoneum and atrophy of the nerve fibres. 4. The follicles participate in this process in two different ways—either they present an exaggerated development, each ovary showing cystic degeneration, representing the Graafian follicles in different stages of their development; or the follicles are destroyed, having undergone an atresia which involves the primary and the Graafian follicles. 5. The same process of atresia occurs also in cases of cystic degeneration with the formation of small cysts, the result of the atresia being to cause the appearance of bodies of different dimensions (corpora albicantia), corresponding to the volume of the distended follicles. 6. This obliteration of follicles appears to be the most frequent mode of termination of affections of the ovaries (follicular oöphoritis). 7. The medullary substance of some ovaries is characterized by excessive vascularity. Among my 250 cases chronic oöphoritis coexisted with uterine fibroid four times, the ovaries in every instance being large, smooth, firm, very sensitive, and descended into Douglas' pouch. The fibroids themselves were comparatively small, whereas the ovaries were enlarged to three or four times their natural size and the source of considerable suffering; in fact, it was really the oöphoritis that brought these patients.

[1] Gazette de Gynécologie, Paris, March 15th, 1891.

Uterine cancer has been advanced as an occasional cause, but I have as yet met with no instance of this combination.

(*k*) *Uterine Displacement.*—It is difficult to determine in how great a degree chronic oöphoritis is dependent upon uterine displacement. That the connection is slight there is very little doubt, though it is conceivable that in some cases of retrodisplacement, especially when coexisting with or due to previous peritonitis with consequent adhesions or shortening of ligaments, chronic congestion of pelvic parts may be set up and inflammation of ovaries thus result. Or the ovaries may be dragged down from their normal position and secondarily become the seat of congestion with ultimate inflammation. This does sometimes occur, though hardly as often as is supposed. Fontana is of those who believe that uterine displacement is a factor in the production of oöphoritis, placing special stress upon retroflexion. Kugelmann claims that descensus and prolapsus uteri are particularly important. To a certain extent my facts bear out Fontana's claims; but that backward displacement is of great importance can hardly be believed in the light of the following figures. In all but 13 cases the position of the uterus was carefully noted in my 250 instances of chronic oöphoritis, these positions being:

Normal	77 times.
Anteflexion	41 "
Anteversion	22 "
Retroversion	51 "
Retroflexion	16 "
Lateroversion, left	9 "
Lateroversion, right	4 "
Antelateroversion, left	1 time
Retrolateroversion, right	1 "
Retroversion of anteflexion	1 "
Normal but low	2 times.
Retroverted and low	7 "
Retroflexed and low	1 time.
Descensus (second degree)	2 times.
Descensus (third degree)	1 time.
Retroflexed and lateroverted, left	1 "

We here note that in the largest number of cases the uterus remained in its normal position; that backward displacements were comparatively frequent, conjointly about equalling normal placement; that compound malpositions were unusually common, a striking indication of the probable dependence of the

disease upon pre-existing peri-uterine inflammation. Descensus played but a small part in the production of oöphoritis. Compared with uterine displacement in other forms of genital diseases, the most notable and marked variations will be found in the relative existence of retrodisplacements and in compound malpositions. Thus, for comparative purposes, the following table has been arranged, the cases classified under the head "general uterine cases" consisting of a series of unselected cases presenting themselves consecutively for the treatment of some form of uterine malady:

Position of uterus.	General uterine cases.		Chronic oöphoritis.	
	Number.	Per cent.	Number.	Per cent.
Normal	894	39.2	77	32.5
Anteflexion	457	20.0	41	17.3
Anteversion	193	8.5	22	9.3
Retroversion	414	18.1	51	21.5
Retroflexion	90	3.9	16	6.8
Retroversion of anteflexion	32	1.4	1	0.4
Retrolateroversion, right	9	0.4	1	0.4
Retrolateroversion, left	6	0.3		
Antelateroversion, right	2	0.1		
Antelateroversion, left	9	0.4	1	0.4
Lateroversion, right	11	0.5	4	1.7
Lateroversion, left	23	1.0	9	3.8
Descensus	141	6.2	13	5.4
Retrolateroflexion, left	1	0.1	1	0.4
Total	2282		237	

(*l*) *Prostitution*, particularly when such a life is entered upon at an early age, is very apt to produce a condition of chronic oöphoritis. The causes here are manifold. Excessive venery, irregular mode of life, alcoholic excesses, and the dangers of gonorrhea, all acting together in a vitiated constitution, tend to induce chronic ovarian disease. Duncan and Tait both remark the extreme frequency of chronic oöphoritis in young prostitutes. "In prostitutes," says Tait,[1] "of a tender age, this affection is of extreme frequency, and often ends in the chronic ovaritis with adhesion of the Fallopian fimbriæ to the ovary, and the subsequent atrophy of all the sexual structures, so often found in their bodies." According to Walter and Renaudin

[1] "Diseases of the Ovaries," 1883, p. 92.

the ovaries of prostitutes are seldom found without some morbid lesions—an experience which has been confirmed by that of Dr. Oldham, who found the changes to be those principally of oöphoritis. Of the 12 cases in single women coming under my notice, 6 at least were leading lives of prostitution and 2 others had already given birth to a child. Besides these, 2 of the married women admitted impregnation before marriage. The almost universal sterility of old prostitutes finds its explanation in the existence of this chronic ovarian disease. Oöphoritis when occurring in the single—unless some other cause, as, for instance, the infectious diseases, can be positively determined—points almost unmistakably to illicit intercourse for its origin, gonorrhea being an extremely important element in such cases.

(*m*) *Unilateral Ovarian Cystoma* is frequently accompanied by marked disease of the opposite ovary. This is a matter of common experience, as shown by the fact that the removal of the non-cystic ovary together with the one the seat of cystoma is of very common occurrence. Thus Tait in 89 instances of ovariotomy removed both ovaries 27 times. The explanation here is also simple. Just as a kidney does double work when its fellow is crippled and unable to do its part, so will the ovary take up the work of its mate when diseased, such overwork finally resulting, from continuous congestion, in chronic inflammation.

(*n*) *Emotional Causes*, such as fright when sudden, have several times in my experience induced chronic oöphoritis, more especially the atrophic form. The sudden cessation of menstruation from such a cause is of common experience, and in several instances of which I have notes the menstruation recurred only at long intervals and finally ceased altogether, the ovaries being found on examination small and functionless, the uterus having shared a like fate. Goodell instances among other emotional causes long engagements, disappointments in love, single life, reading corrupt literature, unhappy marriages, nerve exhaustion, and hysteria—all these, he claims, producing disturbances in the ovarian circulation which in time pass over into a condition of chronic inflammation.

(To be continued.)

HEMATOMA OF THE VULVA.

WITH REPORT OF A CASE.

BY

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(With plate.)

PATIENT 32 years old, primipara; had one miscarriage two years before at five months, brought on by a fright.

The whole of the superficial venous system was much nearer the surface than ordinarily is the case. The long, saphenous veins were much distended and tortuous, especially near the thigh. Had been so for years. Father had that peculiarity. The patient wore elastic stockings reaching from the ankle to the thigh. She wished to have them on when she was in labor, and they were put on near the end of the first stage.

Labor came on a little after midnight, November 20th. Pains regular and strong, but when I first saw her, at noon the next day, the cervix was still long, though the os was patulous. The pains, however, continued, and about 5 in the afternoon the second stage of labor commenced. Shortly after there appeared at the vulva a stream of blood, which made me fearful of a separation of the placenta or the rupture of a vessel of the vagina. I thought the latter might have taken place, as one of the parietal bones of the presenting head overlapped the other, so as to give a very sharp cutting edge. To stop the hemorrhage I brought down the head as quickly as I could.

The perineum was stiff and unyielding, and I had hot cloths applied to the vulva, and also gave some chloroform, partly to relax the perineum, and partly because the pains were so severe.

The labor terminated at 6. The placenta followed shortly

[1] Read before the Section of Obstetrics and Gynecology, New York Academy of Medicine, May 25th, 1893.

without any trouble, the uterus contracted. I had a douche given, as I found there were a number of clots in the vagina.

An hour after labor there was no appearance of hemorrhage. The fourchette was lacerated, the laceration extending a little into the perineum, but not enough to necessitate taking a stitch.

At 11 the nurse said that there began to be a hemorrhage, and the left labium majus swelled to the size of an orange in a very short space of time. It was tense and glistening. When I got there, a little after 2, the swelling was beginning to subside. The lower portion of the vulva, where the slight laceration had been, was marked by a huge clot, and the vulvar orifice was filled with a clot, and the blood was clotted about the mons veneris. There was very little blood escaping, and, owing to the exhausted state of the mother, I thought it better not to disturb anything until morning. Should hemorrhage again take place, the patient could ill afford to lose the blood, and, owing to the imperfect light, it might be impossible to find the bleeding point.

The next morning the tumor had decreased still more in size and the clots were removed from the outside. It was not an easy task, as the clots were firm and resisting, and every touch was painful. I endeavored then to clear the urethra, which was blocked up with a clot. It was difficult to find that opening, as the parts were so sore and swollen. It was therefore a matter of congratulation that the patient was able shortly after to void her urine herself.

While attempting to remove the clots which had formed about the laceration bleeding recommenced. This determined me to use the expectant plan of treatment. I ordered two douches daily of 1:3000 bichloride, and that the vulva be dressed with the same. Bismuth was thrown into the vagina, after the douches, by a powder blower.

It was remarkable how quickly the tumor subsided. Huge vaginal clots came away three days after, and on the fourth day it was hardly larger than a butternut, and on the seventh day the clot attached to the labium fell off, leaving a nice, clean wound and the parts of normal size. The uterus contracted steadily and normally.

While the hemorrhage was at its height on the evening that the hematoma formed, the nurse removed the elastic stockings, and she said that after that the hemorrhage stopped very quickly. The veins about the vulva were not markedly dilated.

In this rare affection there are several points of interest which, with the accompanying case, may prove of profit when presented for consideration.

Hematoma of the vulva has come to include those cases of extravasation of blood into either one or both of the labia—most frequently the left, it is asserted—while hematocele is restricted to such extravasations occurring in the vagina. Older writers use hematocele for both the external and internal hemorrhage. Sometimes they speak of vulvo-vaginal hematocele or hematoma, as the case may be, according to the situation of the sanguineous tumor. It is sometimes called thrombus of the vulva; but as there are cases when the tumor is due to the extravasation of arterial blood, the term thrombus should be used only when it is known that the tumor is of venous origin.

It is a question as to the comparative frequency of this trouble, and likewise as to the comparative frequency of its location. Some writers have thought that the pudendal form was more frequent than the vaginal, but I think that the literature and experience would show the reverse to be the case.

When it occurs disassociated with pregnancy it is traumatic in its origin. It is difficult to imagine any other cause.

It sometimes occurs spontaneously before labor. There are a number of cases reported of this nature. Its occurrence during and after labor can be easily accounted for as due to trauma, but it is not easy to account for its occurrence spontaneously. One writer thinks that it is due to the extreme vascularity of the parts, and the increased tension on the vessels, concomitant with the pregnant condition; while during labor it is caused by anything that obstructs the circulation, as an unusually large head, a contracted pelvis, or extreme efforts of the patient. In estimating the frequency of the accident the following table (see opposite page) is given by Wenning,[1] who says that he thinks the frequency is about one in two thousand. Winckel gives it as his experience as one in sixteen hundred. To make any such average is impossible and does not seem scientific. We all know how such cases may come in groups, the observer having had a wide experience and for years may not have encountered a case, when suddenly one or more may occur in his practice.

Another interesting point that has been raised is whether the

[1] Table given by W. H. Wenning, Obstetrical Gazette, Cincinnati, 1883, vol. vi., pp. 617.

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AND
DISEASES OF WOMEN & CHILDREN
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HEMATOMA OF THE VULVA – *PECKHAM-MURRAY.*

Name of observer.	Cases.	Cases of labor.	Years of observation.
Johnson and Sinclair	7	13,748	7 years.
Hecker	5	16,485	
Dubois	8	14,000	
Hegenberger	11	14,000	
Späth	4	6,000	
Other Vienna observers before Späth	10	33,241	
Spiegelberg	5	50,000	
Deneux	8		40 years' practice.
Hervez de Chegoin	1		20 years' practice.
Charpentier	2	18,000	2 last years.
Scanzoni	15		
McClintock	25		
Barker	22		
Gueniot, Perret, and Bouchard, each	2		
Winckel	1	1,600	

accident is dependent on a varicose condition of the veins. One would naturally think that such would be the case; but the reports would prove the contrary. It rarely occurs when such a condition is present, and extreme varicosity of the vulva is not uncommon in pregnancy. There was not at any time any appearance of varicose veins about the vulva in the case presented. I examined with especial reference to this. I think that the veins were very distensible, and probably the elastic stocking distended those of the pelvis to an uncommon degree.

The size of the tumor depends on the size of the vessel ruptured, as would also the rapidity of its appearance. There are several instances on record where the tumor has formed an hour or more after the labor, when the uterus has contracted and there was every appearance of a normal termination. This is no doubt due to the fact that the injured vessel was small, and that the pressure of the head had closed the point of rupture, which opened again. In many instances recorded the tumor has been of enormous size—as large as a child's head, a cocoanut, or a man's head they have been described. The appearance of the tumor is shining and glistening, or, when the extension is extreme, ecchymotic well-nigh to gangrenous, and generally a spontaneous rupture occurs. The rent in the perineum prevented this extreme distention in my case. The pain is dependent on the distention, as also the amount of tension of the clitoris. It was very great in the case reported if the parts were touched, otherwise there was no trouble. In Dr. Simon's case, where the vessels which ruptured were in the neighbor-

hood of the clitoris and the distention was very great, the patient shrieked with the pain.

The most important question of all is the one in regard to treatment, and there are earnest advocates for both methods, the operative and the non-operative. It must doubtless be decided by circumstances. In deciding not to operate unless there should be some imperative demand for it, in the case presented, I had in mind a case of pelvic hematocele following labor which had occurred while I was interne at the New York Infirmary, in which the extravasation was rapidly absorbed without any interference. It was surprising how rapidly the mass in Douglas' cul-de-sac disappeared. It has been seen how rapidly this occurred in my case, and such is the history of most of those on record. The rapid changes, owing to the preparation of the parts for the subinvolution, must account for this. I say preparation, for several cases are cited where the hematoma occurred a week or two before delivery, and the healing was of surprising rapidity, whether left to absorption without incision and the emptying out of the clots, or after this was done. In either case great care should be taken to keep the parts aseptic, and the rule is that the patient goes on to recovery with little constitutional disturbance.

This brings us to the consideration of the gravity of the complication. Concerning this, too, there has been great diversity of opinion. Girard thinks that it is considered more grave than it is, and that the number of fatal cases has been due to infection, wrong diagnosis, and the lack of skill of the ignorant midwives who have been in charge. He gives twenty-four cases in one hundred and twenty, Deneux gives twenty-two fatal cases out of sixty, Perret seventeen out of forty-three, Johnson and Sinclair two out of seven. The mortality depends upon the time that the hemorrhage takes place and upon the extent of it. If it occurs during labor it is fatal both to the mother and the child. If it occurs late in the second stage, or after delivery, the prognosis depends on the extent of the hemorrhage, but in the majority of cases has been favorable.

THE MADISON, 25 MADISON AVENUE.

THE VALUE OF TREATMENT IN PELVIC DISEASE.

BY

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REPORTS of successive years' work in pelvic-abdominal surgery continue to claim space and attention in all the journals of the day, and if this branch of surgery be growing less invasive we do not hear of it. Even text books fresh from the press, with but few exceptions, show the same trend, and, after unsatisfactory comment upon the value of slower methods of relief, proceed to full-length portraits and descriptions of the more radical means of cure.

Yet the gynecologists who weigh, as they always did, the questions of conservatism and radical procedures well in the balance, seem to be for a time silenced, notwithstanding the fact that the two elements are not incompatibles and that a safe reaction between the two can be produced. The existence of the *conscientious* gynecologists, too, seems to be mockingly questioned in these times; and if they still live who consider well the benefit to the patient before the fame of "the operator of the day," the profession and the laity alike are in quest of the species.

There should be no reason for the general practitioner of the day to look askance at the specialist in gynecology and accuse the latter of "hypocrisy" and of greed for fame, if not for gain. It seems to me that the root of the trouble has not yet been reached nor the truth of the matter been acknowledged. Perhaps the brilliancy of result attained in the past few years has blinded even painstaking workers and has been the pardonable cause of so great an operative fury.

Every gynecologist knows what palliative measures will accomplish, and if he cannot publish scores of cases where patients have been made most comfortable by these means, he is not honest. And the truth revealed is that, were a *little* more time with *much* more patience employed, the operating table might be in *less* demand.

Take a case of chronic catarrhal salpingitis with ovaritis, for instance. The ovaries are large and tender, the tubes swollen and tortuous; there are adhesions to the lateral walls of the pelvis, though not numerous. The symptoms of painful menstruation, more or less intermenstrual pain, much general pelvic tenesmus, and sterility are all rehearsed by the patient.

The appendages are removed—with what result? Sterility, of course. Then there intervene several months of more or less pain, irregular flow, distressing nervous symptoms, all attendant upon the abrupt establishment of an artificial menopause; at times there is fixed pain in the region of the stumps. All these bring disappointment to one who hoped for great and speedy relief from an operation undergone after a long season of preparatory treatment.

Suppose the treatment had been but palliative. What is the history? Although the more time may have been consumed, there will be more regular recurrence of painless periods, absence of intermenstrual pain, relief of the general pelvic distress. Sterility is not even an absolute prospect, and in place of the attitude of depression and nervous inelasticity there is gradual improvement of the general health, abeyance of marked nervous disturbance; usually the whole *morale*, physical and mental, assuming a more healthful tone.

And yet these latter cases are untold and unpublished amid all the clamor of progress.

In the Woman's Hospital of Philadelphia, with which I have been connected for the past four years, there are reported for the year 1892, 824 house cases, 407 of which were in the gynecological wards. Of these there were 106 cases in which were various forms of disease of the appendages. For 47 of this number laparatomy, or celiotomy, was performed, with a mortality of but three cases. We tabulate, for convenience, as follows:

47 in which laparatomy was performed.
36 discharged improved; *no* operation.
20 unimproved.
3 not treated.

In the afternoon clinics of the out-patient department, of which I had charge, there were for the same period 392 new cases, 315 being gynecological. Of these there were 84 cases of different forms of disease of the appendages. They were classified as follows:

Ovaritis and salpingitis 40
Cystic disease of ovaries..... .14
Prolapsed ovaries..... .10
Peri-ovaritis..... .15
Hydrosalpinx 3
Extra-uterine pregnancy 2

Of these 84 cases laparatomy was done for 4—1 for extra-uterine pregnancy, 1 for hydrosalpinx, and 2 for cystic disease of the ovaries.

The remainder had all, of *necessity, not choice,* to be under palliative treatment alone. The following cases, given for illustration, will tell what that treatment accomplished. They are selected because they are cases that reported themselves for three, four, or five months after being discharged well. The others were alike under treatment, with equally good immediate results, but sufficient time has not elapsed to permit their being brought forth as evidence.

Case I.—R. B., æt. 26 years, married nine years; one child 7 years of age. Came under my care January 23d, 1892. History of painful periods; flow scant, at times largely clotted; much intermenstrual pain; much distress after walking but a short distance; pain in both iliac regions, extending down into the thighs. Complained of fickle appetite, obstinate constipation; was nervous and irritable.

Bimanual examination revealed the large, retroverted, adherent uterus. Ovary to the left prolapsed and tender. Tubes swollen and tender. Great tenderness throughout posterior and lateral fornices.

The following was the treatment used: The application of tincture of iodine to the cervix as high up as the vaginal vault. Two tampons of antiseptic wool, one anointed with a mixture of equal parts belladonna and compound iodine ointment, the other saturated with a ten-per-cent solution of ichthyol and glycerin, were used; these were packed well up behind the cervix, one in each lateral fornix, with the patient in the knee-chest position.

She was instructed to carry out treatment at home in the following manner: Removing the tampons at the end of twenty-four to thirty-six hours, a vaginal douche of three quarts of hot water, medicated by the addition of a tablespoonful of powdered borax, was to be taken once daily. The knee-chest

posture was to be assumed once a day, holding it from twenty to thirty minutes.

Depletion was secured by means of a saline laxative night and morning, unless the bowels were too freely moved. In addition a digestive mixture was prescribed.

The patient came twice a week for the local treatment. After three weeks of the routine, during which both rational and physical signs showed improvement, she came into the house, that treatment might be pursued more satisfactorily. For six weeks she was under constant observation. During that period the uterine cavity was dilated, curetted, irrigated, and capillary drainage of tubes and endometrium established by means of iodoform gauze packed well into either cornu. Three times was this done, then followed by the return to the vaginal packings before described. At the end of her six weeks' stay there was great reduction in size of the uterus and of the lateral masses, with so marked an absence of all tenderness that previous to her discharge a hard-rubber Hodge pessary was introduced and worn with great comfort.

She reported herself at varying intervals through the year, even as late as December, 1892. There had been no relapse of the trouble, despite the fact that the patient had not been wholly free from many demands of family and society.

Case II.—A. G., æt. 36 years, married eighteen years; a two months' miscarriage one year after marriage; one child, not now living, born the following year. This labor instrumental, resulting in a cervical tear, repaired seven years ago.

Came under my care February 1st, 1892. History of acute exacerbation of an old endometritis; periods of late had been very scant; increasing dysmenorrhea; intense backache; pelvic tenesmus; also an intense pruritus vulvæ.

Bimanual examination revealed the congested, retroverted uterus, with marked tenderness all over the uterine body; a mass posterior and to the right, very tender to palpation, corresponding to the appendages of that side, but, owing to exudate, not distinctly outlined. Counter irritation over either iliac region was prescribed. Depletion obtained by saline laxatives. A tampon of belladonna and compound iodine ointment was packed high into the posterior fornix, with the patient in the knee-chest position.

As the patient lived out of the city, the journey back and

forth, with its incident exposure, being deemed inadvisable, she too was admitted to the hospital one week following her appearance at the clinic. Thereupon she was put upon general tonic treatment, with the usual attention to the regulation of the bowels, depletion being maintained by salines from time to time, as indicated.

Vaginal packings with ichthyol and glycerin, also belladonna and compound iodine ointment, were used thrice weekly. A daily douche of four to six quarts of hot water, medicated as above, and before each treatment the vaginal injection of 1:8000 bichloride of mercury, were given.

Her first period, not two weeks after entrance to the hospital, was painless, profuse, continuing four to six days. At the end of five weeks of treatment (the patient being compelled to return home) there was no pelvic tenderness. A soft-rubber Hodge pessary was inserted and the patient directed to continue the daily douches. She was seen as late as October, 1892. Had no relapse of acute trouble, the periods were normal, and the general condition was extremely good; there was but slight fulness in the region of the appendages on the right; absolutely no tenderness.

CASE III.—J. E., æt. 36 years, married seven years; four children. Labors all difficult; at the last, four months before her appearance at clinic, craniotomy had been done. Presented herself for the first time March 24th, 1892. History for the last two months of almost constant though slight flow, at times accompanied with great pain; severe backache; great pain in the region of the appendages; obstinate leucorrhea; extremely nervous and irritable.

The bimanual revealed a laceration of the cervix up to the vaginal vault; a perineal laceration back to the sphincter; much peri-uterine tenderness; appendages exquisitely tender; considerable pelvic exudate.

Ordered counter-irritation with ointment of the red iodide of mercury over either inguinal region; iodine to the cervix; tampons of tincture of iodine and glycerin, one into either lateral fornix; interchangeably with this the ichthyol and glycerin solution used. The routine of douches, injections, etc., with the daily practice of the knee-chest position, was also instituted.

These measures, with attention to the emunctories and general nutrition, continued for six weeks. At the end of that time,

domestic difficulties interfering, she was obliged to abandon her dispensary visits. She was given instruction to continue the daily douches, etc., and told to report herself at the end of each period.

When last seen, January, 1893, while no local examination could be made, her general condition was excellent. She had been able for many months to do the work for a large family with surprising ease.

Case IV.—C. G., æt. 31 years, single. History of irregular periods, with increasing dysmenorrhea, for the last five years; intense backache; sense of constant weight in the pelvis; pain in both groins, lancinating, extending down into the thighs; constipation, flatulence, dyspepsia; general nutrition poor. First seen May 4th, 1892.

The bimanual revealed the uterus retroflexed, congested, very low in the pelvis; ovaries prolapsed, large, and tender, the right one evidently cystic; thickened tubes; no adhesions that were especially firm.

The treatment previously detailed was prescribed. That she might be under constant observation, the patient came into the house for six weeks. At the end of her stay, while there was no tenderness and all the rational symptoms had improved, the large ovary to the right was still appreciable, and accordingly operation was advised. Contemplating marriage, the patient decided the matter for herself, refusing radical procedures.

When seen in September, 1892, she was reported as having had no sign or symptom of discomfort.

Case V.—E. G., æt. 22 years, married four years; one child, aged 3 years; one miscarriage, of two to three months, a year ago. Presented herself April 11th, 1892. Had been under the care of a physician for three months previous, evidently for an acute ovaritis and salpingitis. Her physician leaving town, the patient put herself under our care. She had improved markedly under former treatment, the only distressing symptom at this time being severe backache. She was anxious to be made as comfortable as possible, as she was forced to remove with her family to Indian Territory in less than a month's time.

The bimanual revealed the large, retroflexed uterus; no tenderness; ovary to the left prolapsed, but absolutely no pain, tenderness, nor fulness in the region of the appendages.

She was fitted with a Hodge pessary with a padded posterior

arm (soft rubber). Was instructed to treat herself with the daily vaginal douche, and taught to assume the knee-chest position, that she might practise it daily.

Once again she was seen, and the pessary examined *in situ*, before she left the city.

In January, 1893, I heard from her directly to the effect that she had known nothing but good health during this interval.

Case VI.—R. L., æt. 28, single. For the past four years suffered from constant ovarian pain, intense backache, increasing dysmenorrhea, distressing reflex nervous symptoms, intense headaches, obstinate constipation, flatulence, etc. Presented herself August 7th, 1892.

The bimanual revealed the uterus in normal position, though rather low in pelvis; ovaries prolapsed and tender, the right one probably cystic.

At once the routine treatment of posture, vaginal douches, vaginal packings, as detailed, was instituted. The emunctories were regulated and the general nutrition improved. This was continued for three months. Local treatment as before was given twice each week. At the end of the time, while not discharged by me, treatment having to be abandoned, she had shown rapid improvement as to both the rational and physical signs In January, 1893, she reported herself as being "perfectly well."

Case VII.—E. P., æt. 29 years, married six years; no children; one miscarriage five and a half years ago. Presented herself January 13th, 1892. History of painful, profuse periods for the last year and a half; constant backache, headaches, etc.; pain in ovarian regions; abundant purulent vaginal discharge.

The bimanual revealed the congested uterus, peri-uterine tenderness, tenderness in both lateral fornices, with appreciable lateral masses. She was ordered counter-irritation over the abdomen, with depletion by the use of salines, followed by routine of postural treatment, tamponing of vagina, with daily douches, etc. The patient was under treatment for nearly three months. During this interval the periods became normal; there was gradual disappearance of all tenderness and cessation of the vaginal discharge. All the rational symptoms showed marked improvement in addition.

In September, 1892, the patient was reported as being entirely comfortable, having suffered no relapse during this time.

CASE VIII.—L. A., æt. 25 years, married three years; one child 2 years old; one miscarriage, at third or fourth month, some months before her appearance at the clinic. Presented herself March 28th, 1892, with the following history: After the miscarriage, had evidently some degree of septic invasion, though she had been told it was "typhoid fever." Came now complaining of constant pelvic tenesmus, backache, with distressing ovarian pains and much vaginal discharge.

Bimanual examination found a large uterus; tenderness all over the uterine body; masses to either side, probably the tender appendages, although no definite outline. After three weeks of dispensary treatment she was referred to the house. Here for six weeks she was subjected to the course detailed in foregoing cases. Here again, though operation was advised, the patient elected to do without, feeling so markedly improved.

She reported herself several times during the past winter at the clinic, giving no history of further trouble.

CASE IX.—J. H., æt. 24 years, married one year; not yet pregnant. For the last three or four years had increasing dysmenorrhea; constant backache, with fixed ovarian pain; increasing pelvic tenesmus. Presented herself July 28th, 1892.

Bimanual examination found the uterus retroverted; tenderness in the region of the appendages; both ovaries prolapsed and enlarged, the left one probably cystic.

She was under treatment until September. Upon discharge, the uterus was in good position; although the left ovary was still large, there was absolutely no tenderness.

When the patient was last seen, in December, 1892, both local and general conditions alike remained good.

Perhaps it need be stated that most of these women were in humble circumstances and conditions of life, with families dependent upon their efforts, time therefore being as precious as money.

An argument frequently urged is that operations are resorted to because of taking less time than the course of treatment so often prescribed above. Considering the fact that, unless a patient be admitted to the hospital under exceptionally favorable circumstances, preparatory treatment occupies from three to four weeks, that convalescence after operation extends through four to six weeks more, is this longer a strong argument?

We wish to be distinctly understood as not decrying broadcast

operation when necessary. Indeed, in more than one case cited above the latter was the advice given to the patient. But palliative measures being the necessity and not the choice, we think it only fair that the good accomplished be acknowledged. In each such case the patient was warned of relapse as the probable danger; but with great care even that being minimized, conscientious discharge of both patient and duty was performed.

Another plea: many of these patients were ignorant women or were those of most ordinary intelligence. Talk as we may of the dread of the knife being but fancy, easily overcome, the fact remains that this same dread has driven suffering women from door to door, from dispensary to dispensary, from doctor to doctor, in search of one who could fairly offer some other ameliorating prospect. As a matter of proof, in this same clinic were seven cases, each with fibromyoma of the uterus. The tumors were in no case extremely large, though serious enough to provoke the symptoms of hemorrhage, pelvic tenesmus, irritability of the bladder and rectum, and all the accompanying pressure signs. So long as these women were kept under observation with a view to improving the general nutrition, lessening pelvic congestion and thereby local discomfort—in truth, only preparatory treatment for operation—so long were they comfortable and showed the improvement needed. At the mention of the knife, however, each one was terror-stricken, lapsing into obscurity. And only last week, in response to inquiries made, came the replies that nothing had been done since leaving the dispensary. Of course these were instances in which we deprecate anything but early operation; yet they serve to show how we can defraud other women—whose daily bread is bitterness, whose portion is suffering—of temporary comfort at least, by want of patience and moderation.

337 Second avenue.

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337 SECOND AVENUE.

BY WHAT AUTHORITY ARE RESECTIONS OF THE FALLOPIAN TUBES AND OVARIES AND THE ENUCLEATION OF MYOMATA CHARACTERIZED AS "SURGICAL AMUSEMENT"?

BY

A. MARTIN, M.D.,
Berlin.

THERE is no subject in gynecology more frequently discussed than that of the operations upon the uterine adnexa. It is undeniable that the indications for these operations have expanded only too rapidly from a narrow field to nearly unlimited proportions.

The relative simplicity of their technique and the favorable prognosis of the operations themselves have led to the removal not alone of appendages which are diseased to such a degree that no other treatment can effect a cure, but their extirpation is also resorted to in cases in which it is believed that the abrogation of the functions of ovulation and menstruation will remedy other disorders of the genital organs, and even for the alleviation of groups of symptoms which have no demonstrable, and often but suspected, relations to the functions of the organs of generation.

That there are indications for the removal of the diseased adnexa I fully admit. If the diseased ovaries and tubes are not susceptible of treatment by suitable medicinal measures, they must be removed as soon as they interfere appreciably with the health and usefulness of the patient. In these cases I call the procedure "oöphorectomy" and not "castration." The term "castration" I wish to reserve for cases in which healthy, still functional ovaries are removed. I perform this operation only if I wish to suppress their physiological functions in cases in which there is aplasia of the genital organs. I admit the propriety of castration in the treatment of uterine fibroids, although I never resort to it, preferring to attack the new growth

[1] Read before the American Gynecological Society, May 18th, 1893.

directly. But I am forced to reject the other indications for castration not only by the uncertainty of the results, but also by my observations that the hoped-for cure is frequently not attained and that the condition of the patient is only too often worse after than it was before the operation. I wish to especially emphasize the fact that the general health is more frequently unfavorably affected after a castration than after the double oöphorectomy.

Amongst the symptoms of which patients who have undergone a double oöphorectomy sometimes complain we must differentiate two groups. The one depends upon the presence of the scar formation in the pelvis and in the abdominal parietes. In cases pursuing a normal course these seldom give rise to painful symptoms, which are apt to disappear with the gradual absorption of the scar tissue. The discomfort may be ameliorated by therapeutic measures, and serious disturbances are rarely of long duration. Yet the separation of adhesion bands or the resection of an abdominal hernia may necessitate a secondary operation.

The second group includes the symptoms due to the disturbed functions of the genital apparatus. Menstruation, as a rule, immediately ceases, if the repair of the pelvic wound proceeds uninterruptedly, and the menopause is accompanied by only slight disturbances, which vary with age, individuality, and mode of life. But if the reparative process deviates from the normal, especially if the cicatrices are surrounded with lymph exudations, I have observed excessive and painful menorrhagia, which does not always cease with the absorption of the exudation. This menorrhagia may be a source of serious suffering to the poor patients, and not seldom resists even heroic measures.

Although we so conduct our celiotomies, to the best of our ability and knowledge, as to avoid these undesirable complications, we are as yet unable to formulate the prognosis in this connection with the same certainty as we are to predict that the operation will accomplish the desired cure. Adding to this the fact that oöphorectomia duplex and castration produce sterility, it is obvious that we are in duty bound to avoid, if possible, the removal of both ovaries, be they healthy or diseased.

These considerations arise not alone in cases in which the indication for castration is doubtful, but they must also be extended to those cases in which the diseased adnexa urge us to operative

interference. Undoubtedly the sequelæ of the operation appear, especially of the second group, or at any rate only inconsiderably, if but even a small portion of ovarian tissue be permitted to remain.

The possibility of a partial removal of the ovaries, or the opening of hydropic follicles, has already been pointed out by that master of ovariotomy, Sir Spencer Wells. The procedure has been systematically developed by Schröder and myself. I have further extended this field of conservative gynecology to disease of the Fallopian tubes and to myomatous degeneration of the uterus.

TABLE OF "CONSERVATIVE OPERATIONS" PERFORMED BY A. MARTIN, OF BERLIN.

	Operations.	Deaths.
Resection of one ovary, or multiple puncture of hydropic or hemorrhagic Graafian follicles, after the other ovary had entirely been removed..... Of these twenty-six cases, the remaining portion of the ovary became diseased in two, necessitating a second celiotomy. Of the remaining twenty-four cases, eight became pregnant.	27	1
Resection of atretic Fallopian tubes after extirpation of the other diseased oviduct..... In four of the thirty-eight cases recovery was not permanent; the pre-existing perimetritis continued. In one case conception took place.	40	2
Enucleations of interstitial myomata of the corpus uteri..... These comprise a number of operations dating from a period when the technique of abdominal section was yet in the developing stage. There was no death amongst the last twenty operations. Of the remaining one hundred and fifteen cases, recurrence was noted in four; two became pregnant.	141	26

This modus of conservatism was at first rejected as "surgical amusement." But as soon as a series of successes could no longer be denied, others made timid attempts in this direction. To my great satisfaction S. Pozzi, in an excellent paper,[1] advocated the resection of the ovaries. So far as is known to me, the opening of atretic Fallopian tubes has thus far found no other advocate. Skutsch, however, has performed this operation inde-

[1] Ann. de Gyn. et d'Obst., Mars, 1893.

pendently of my publications; others, Zweifel for instance, have rejected it after a few trials. What are the reasons for this?

As interference with healing is practically not to be feared, as shown by my series of successful operations, it was pointed out that the maturing of the Graafian follicles might be unfavorably influenced by a resection of the ovaries and the scar formation necessarily following it. This scar, it is said, would become painful. The danger of a return of the disease was also interposed as an objection. I admit that this remnant of ovarian tissue may undergo degeneration, but that there exists a peculiar predisposition my experience has not demonstrated.

Of twenty-six cases recurrence took place in two, while in twenty-four the normal functions were preserved. The two recurrent cases referred to were relieved by a second operation, and it should also be noted that up to six months ago these patients remained in perfect health and in the full possession of their sexual faculties.

As I pointed out in 1888, a second celiotomy upon the same person offers no obstacle; it is not attended with sufficient technical difficulties to raise the fear of a possible return of the disease. I also wish to ask, is the complete removal of both ovaries an absolute protection against renewed disease, inflammatory processes, and new formations? Not at all. The stumps may become the seat of disease, and fibroid tumors, and even malignant growths, may appear after castration independently of the previous disease.

The opening of atretic Fallopian tubes appears to Pozzi illogical. He says the disease which led to atresia must necessarily destroy the active elements of the oviduct and exclude regeneration after their resection. This statement I again cannot admit as true. It must, of course, be understood that a resection can only be successful in tubes the contents of which are of a serous, non-infectious character and are free from pus. The surfaces of the tubal walls must be smooth; ulcerative processes naturally exclude resection. If the tubal walls and contents conform with these indications, the cavity should be cleansed and disinfected before the edges of the wound of incision are stitched. Tubal sacs in existence for a long time also collapse after being thus treated, and a contraction of their walls can, as a rule, be recognized.

So far I have not been able to demonstrate a regeneration of

the tubal epithelium. That this occurs I feel certain, in analogy with the regeneration of the uterine epithelium after the expulsion of the ovum.

But has it been proven that an intrinsic activity on the part of the tubes is necessary to permit of their normal functions? What part does the oviduct play in the transit of the ovum to the uterus? This is as yet not known. Now, as pregnancy has occurred in one case of tubal resection, we are forced to admit that the resected tube is still capable of performing this function.

At the German Gynecological Congress held at Bonn in 1891, Chrobak opposed tubal resection, arguing that it might lead to the production of extra-uterine pregnancy, and Landau contended that the operation would open the gates to septic and gonorrheal infection. Extra-uterine pregnancy has, so far as I know, not occurred amongst my cases. We do not yet know the mechanism of ectopic gestation, so that this criticism may be withheld until the complication has been observed.

I do not share the fear that the resection may lead to septic or gonorrheal infection. As already stated, resection is contra-indicated if the contents of the tubal sacs are of a septic or gonorrheal character. What may subsequently enter the tubes is a matter against which these patients can as little be guarded as other, healthy women.

To these conservative operations I add as a third group the enucleation of myomata.

When I performed this operation first in 1879, I was struck by the simplicity of its technique, the reconstruction of the uterus, and the satisfactory results to the patient. Since then an extensive experience has convinced me that myomata should be treated by enucleation, celiotomy, and by laparatomy in young persons, if the tumor is not much larger than the size of a fist and consists of one or but a few sharply defined nodules.

Under these conditions the prognosis of the operation is favorable. Of fourteen patients under 36 years of age twelve recovered, two died.

If it is not necessary to open the uterine cavity, so much the better. There then results an involution of the uterus that leaves the organ of its normal configuration. Recurrence cannot in advance be excluded—that is, that minute nodules, latent at the time of operation, shall not later be roused into activity. This occurred four times amongst one hundred and fifteen cases

under my observation. But is this a high percentage, considering the large number of fibroid nodules often found in the uterus and the frequency of myomata?

Clinically, it has long been known that myomatous nodules may develop after the menopause. This may also happen after castration, as I observed in a case of oöphorectomia duplex. Are women after enucleation exposed to dangers from which they are free without operation?

Finally, I have to add that enucleation preserves the possibility of conception. This consideration arises, at most, in but a limited number of cases. The majority have passed the boundary line; many are virgins; and in some the source of the sterility may be found in the husband.

In the remaining cases, however, the preservation of the sexual faculties is of inestimable value, as the observation of many cases has led me to conclude. That this desideratum was only fulfilled in a limited number of cases affords no legitimate objection; the mere possibility of an ensuing pregnancy has in many of my cases been sufficient to disperse threatening shadows from marital happiness.

I am to-day able to report two cases in which conception occurred, labor proceeding spontaneously and without difficulty.

Now, if the prognosis of enucleation is comparable with the prognosis of the other methods, and the theoretical objections regarding recurrence are shown to be unjust, by what right dare we deprive these patients of the possibility of preserving their sexual functions?

These figures are sufficient to prove that this conservative operation adds no danger, so far as convalescence is concerned.

That the vast majority of patients are relieved of their symptoms and remain cured.

That recurrence or disease in the resected organs is exceptional.

That the woman preserves her sexual functions; and that pregnancy is possible with such partially preserved organs.

Practical experience has shown the objections to the conservative methods to be unwarranted. The criticisms must, therefore, be characterized as unjust. It may even be asked if this form of conservative procedure is not demanded under the conditions named, and if in these cases the operator has a right to destroy the female sexual functions.

CLINICAL REPORT OF CASES OF PYOSALPINX TREATED BY UTERINE DRAINAGE, WITH SUBSEQUENT CONCEPTION.[1]

BY

ROBERT A. MURRAY, M.D.,
New York.

It seems almost like heresy to bring before such eminent specialists and abdominal surgeons a paper having for its object the demonstration that pyosalpinx can be cured in some cases without resort to celiotomy and removal of the offending organs. From the pathology of Bernutz thirty years ago, and the demonstrations by Lawson Tait, Hegar, and many brilliant operators following their methods, gynecologists became convinced that the vast majority of cases commonly diagnosticated pelvic cellulitis were really cases of pelvic peritonitis resulting from disease of the Fallopian tubes and ovaries. The reasoning, however, was deficient, in that it did not go back to the cause of the disease in the tubes; and the treatment defective, when it did not seek to remove the endometrial inflammation which preceded the salpingitis. So we have had an era in which, to the practical surgeon, the diagnosis of tubal disease, particularly if there had been recurring attacks of pelvic inflammation, was the absolute indication for celiotomy and removal of the tubes and ovaries. During this period of tubal operations, from 1877 to 1886, I had a class in gynecology in a dispensary which afforded a large field for observation of cases of salpingitis. The patients were poor, of the working class, and could not generally be persuaded to go to a hospital. At that time the ordinary treatment of these cases was rest; application of iodine and alteratives to the cervix, cervical canal, and vaginal vault, counter-irritants, hot douche, as introduced by Dr. Emmet; and the use of the vaginal tampon, made with or without antiseptic and alterative drugs. Under this treatment many of the cases grew better slowly and required

[1] Read before the American Gynecological Society, Philadelphia, May 18th, 1893.

much general tonic treatment and care to prevent recurrence of the attack.

Following Prof. C. A. Budd and Dr. Leute, I very frequently made applications to the endometrium with Churchill's tincture of iodine, carbolic acid, and other irritant alteratives, but to do so had to dilate the cervix fully to prevent uterine colic and slight attacks of peritonitis. If the cervix was fully dilated the pain was not persistent after the applications, and the subsequent decrease in size of the large tubes and uterus was very marked.

In a number of the cases the patients told me that after this treatment there followed a profuse whitish discharge, and their relief from pain was coincident with this flow. And having observed this result, I was led to believe that, in my endeavor to cure the endometritis and to contract a large subinvoluted uterus by the intra-uterine application, I had afforded a means of drainage to products of inflammatory action which being retained were the cause of disease. It then became my practice to dilate the cervix and to curette the endometrium—which I did because many had the history of previous abortions—the result being that improvement was very rapid in their general condition, and the tumors formed by the matted tubes and ovaries would very frequently entirely disappear, the uterus becoming movable. Pregnancy ensued in some of the cases which I followed, and, having confined them without any puerperal accident, I believed them cured. I did not at that time use iodoform gauze, though sometimes employing a loose tent of absorbent cotton in the cervix. These cases were not only those of a catarrhal nature, but also pyosalpinx, as was proved by the periodical flow of pus, while the patient was actually under observation, by gently pressing on the distended tube toward the uterus. The cases most benefited by this treatment were those in which the tubes and ovaries were almost at the brim of the pelvis in their normal position. The other cases, where the tubes and ovaries were displaced downward behind the uterus in Douglas' cul-de-sac and attached to the retroverted uterus, were benefited, in that the whole mass could be lifted up by vaginal tamponade, supported and allowed to drain, and so become less tender, more movable, and the heavy bearing-down pains at the menstrual periods were relieved. If these cases of the latter class occurred in people of means, who could take much care of themselves, the benefit was so great that operations seemed unadvisable. But in the chronic

cases, with fixed uterus, and when no lifting up or treatment would aid, the uterine end of the Fallopian tube being sealed by inflammation, and occasional leakages at the fimbriated extremity causing recurrent attacks of peritonitis, I have advised, after a thorough treatment with the tampon of boroglyceride or ichthyol to reduce tenderness and soften adhesions, that the appendages be removed if exploratory celiotomy showed the necessity.

Not to burden the patience of the Society, I will narrate the histories of but six cases, three having a gonorrheal and three a puerperal origin.

CASE I. *Gonorrheal endometritis and pyosalpinx; conception.*—Mrs. M. T., age 21, married; had one child by former husband; no puerperal complications. I saw her in January, 1883, in an attack of pelvic peritonitis with a history of gonorrheal infection five months previous from her husband. She had a very acute attack at the outset of the disease, and since that time suffered from a profuse leucorrhea, extreme dysmenorrhea, pain lasting for a week after menstrual period and confining her to bed. She is relieved by a free flow of matter and is then able to do her duties in the house; coition is painful; and though her disease is better, still after the occasional flow of matter, if intercourse occurs, it brings on a gleet in her husband. Physical examination shows a well-defined mass on the left side, very tender, fixing the uterus in a moderate retro- and left lateral version. Uterus enlarged; cervix lacerated, right side; right tube and ovary matted together, forming mass on right side, but smaller than left side. The vagina was syringed clean with 1:1000 bichloride solution; the cervix wiped dry with absorbent cotton; the cervical canal cleansed with cotton and found patulous to os internum. A tampon of boroglyceride was applied so as to support the pelvic organs, and left forty-eight hours, and absolute rest enjoined. Opiates given to relieve pain, after free catharsis by Epsom salts. The pain was so much relieved at my next visit (in three days) that, after a carbolic douche, I made a bimanual examination and was surprised to find that, making careful pressure on the left tumor, which I recognized as a distended tube, I could cause quite a flow of pus from the uterus. Introducing the speculum, I saw the pus exuding from the cervix. I told the patient of the condition, advised the dilatation of the cervix, the curetting, washing of the uterine cavity, and pressure exerted by tampons

of boroglyceride as she could bear them. Next day I etherized the patient, dilated the cervix, thoroughly curetted the uterus, cleansed it with bichloride douche with double-flow catheter, and applied a loose boroglyceride tampon, removing it in twenty-four hours. There was some soreness after the manipulation, but the temperature, which had fluctuated between 100° in the morning and 103° in the afternoon, became normal, and in three weeks, when I allowed her up, there was no discharge, the uterus had become movable, tenderness, only obtainable on deep pressure, was very slight, the hardness and exudations had almost disappeared from the broad ligaments. She ultimately became thoroughly well under tonics and hot douches. I cured her husband of gonorrhea, dilated stricture, and they were both well. In May, 1885, two years after her recovery, I delivered her of a live child, necessitating version. No temperature or puerperal complications in convalescence.

Case II.—Mrs. R., 19, married five months; always healthy until married; menstruation normal. About two months before consulting me—February, 1884—had profuse leucorrheal discharge, dysuria, heat and burning of vulva, and pain of lancinating character in lower abdomen. After the application of hot poultices to abdomen and hot vaginal douches, got better. Now the patient is suffering acute pelvic pain. Temperature 103½°, pulse 120, respiration 28. Has had vomiting, difficult and painful menstruation; abdomen distended, tympanitic, and very tender, so that the bedclothes cannot touch it. Vaginal examination reveals vulva and vagina hot, with purulent discharge; uterus fixed immovably, exquisitely tender, large exudations matting tubes and ovaries and rendering vaginal vault boardy to touch. Bimanual cannot be practised, as abdomen is too tender. Menses one week ago. Husband acknowledged having a gonorrhea two months before marriage, but thought he was cured, but has had a gleet during the past three months; drinks moderately. Under the use of hot fomentations, poultices, and hot carbolized douches and opiates, with attention to the bowels, the pain and tenderness subsided in a few days, but the hardness of the broad ligaments, peritoneum, and fixation of the uterus did not. Iodine and fly blisters were applied to abdomen and hot douche continued; but there was a rise of temperature each afternoon, and the patient seemed developing suppuration fever. Quinine, iron, and good, easily digested

food were given, and slowly her strength returned. As the tenderness had now subsided very much, bimanual examination revealed uterus fixed but not displaced. At both sides of the uterus, particularly on the right, a mass of exudation, through which could be felt the enlarged tubes, firm, immovable, a purulent discharge flowing from a very small cervix. Pressure on the uterus gave little pain, though in the fornix vagina was tender. After general treatment for ten days longer, with continuation of the local, the cervix was dilated, the uterus curetted and washed out with a carbolic douche, strong carbolic acid being applied to the whole endometrium with an applicator, followed by an antiseptic vaginal douche. Very little reaction followed this treatment, as the uterus was held firm and strict antisepsis was practised. In a week the uterus was much smaller, more mobile, and the exudations were much diminished. A profuse flow of pus now ensued from the cervix, the tubes diminished in size, fever became reduced, and the patient was able to sit up and walk. After passing the menstrual period, which was the least painful of any since her marriage, she declared herself perfectly well. In three months afterward, with exception of some slight adhesions fixing uterus, there was nothing abnormal to be felt. In May, 1886, two years after the attack, she engaged me to attend her in confinement, which occurred on July 1st and was normal, no puerperal complications. I have since confined her twice and attended her in one miscarriage.

Case III. *Gonorrhea; abortion at third month; pyosalpinx; recovery; subsequent pregnancy.*—Mrs. B., actress, 28, married three years, consulted me for severe attack of pelvic peritonitis due to gonorrhea contracted from her husband. Menses normal; history good. She had had the attack of gonorrhea for two months when she called on me; her husband still had gleety discharge. The case was a severe one, but not as protracted as the last cited, and was treated on the same principle, but without dilatation of the cervix or curetting. When able to get up and about, while still some enlargement of the uterus, exudate in the tubes and pelvic peritoneum, she took an engagement, but in three months returned, unable to work on account of abdominal pains and tenderness. Physical examination then revealed the uterus enlarged, normal in position, but immovably fixed by a large exudation on the left side, very

tender to touch; a profuse purulent leucorrhea. Patient put to bed; blister to abdomen, repeated at short intervals; hot douches and laxatives ordered when tenderness subsided; iodine applications to vaginal vault, followed after a while by boro-glyceride tampons. The uterus decreased in size, the exudations diminished, only to show the tube distended and tender, the cervix small, and a profuse leucorrhea. The patient was now etherized, the cervical canal dilated, the uterus curetted thoroughly though gently, washed out with carbolic acid, and strong phenic acid applied to the endometrium with cotton swab, followed by antiseptic vaginal injection; reaction was not marked, the temperature improved, also the pain and soreness. Vaginal tampons were now employed, of boracic acid and glycerin, and at each sitting—usually every third day—the exudate was gently massaged toward the uterus, the result being a flow of pus. The patient became so much better that she took another engagement and worked hard, the only treatment being a continuance of the tonic and hot douches twice a day. In about six months, at the end of the season's work, she presented herself pregnant about three months, the picture of health. She had an abortion before the end of a month, due to a fall, the ovum coming away intact. Convalescence normal, without complications. After a year she became pregnant again, and was confined without puerperal complication.

Case IV. *Pyosalpinx after abortion; subsequent pregnancy.* —Mrs. F., married, 22. October, 1889. Always suffered with dysmenorrhea; had an abortion three months after marriage, followed by an attack of puerperal peritonitis. I saw her with Dr. A. three months after, when physical examination showed large, subinvoluted uterus, exudate on both sides of the uterus, very tender, uterus immovable, profuse purulent leucorrhea. Advised dilating cervix, curetting uterus, and thorough antisepsis. This was done, and followed by hot douche, with vaginal tampons wet with boric acid and glycerin, the tampons applied in the knee-chest position, as the dragging of the uterus on the enlarged tubes caused such pain that she was not able to exercise. The tube emptied, as her physician said, nothing to be done except keep her uterus open and let the tubes drain. This was done. Gradually the discharge ceased. She was delivered by her physician two years after without any puerperal complication; has enjoyed most excellent health, without dys-

menorrhea or pelvic trouble; has now a healthy child nearly 3 years old.

CASE V. *Puerperal peritonitis; endometritis; pyosalpinx.* —Mrs. K., mother of five children; very thin, wiry; 32 years old. May 1st, 1886. One month after last confinement saw her as consultant, with a very severe attack of puerperal peritonitis; temperature 104°, pulse 136, respiration 32; abdomen distended, pulse small, compressible, and irregular, fetid vaginal flow, uterus enlarged, patulous, foul-smelling discharge, large exudate fixing uterus, both sides of pelvis hard and very tender. After antiseptic douche of bichloride 1:3000 the finger was passed into the uterus and pieces of placenta, almost gangrenous in odor, were found attached to the uterus. The patient was so low—another consultant the same morning having refused to do anything—that it was only with the worst prognosis that I attempted to save her. The uterus was thoroughly curetted after antiseptic vaginal and uterine douche, and again washed thoroughly clean, so that no fetor appeared in discharge after operation, the patient not being lifted from her bed. Enemata of brandy and beef tea were given every three hours; digitalis and strychnia by hypodermic, in small doses, repeated until the stomach could retain nourishment. The case improved slowly in her general condition; locally the uterine and vaginal douches reduced the fever and caused the uterus to become smaller. A purulent discharge remained, which, as the uterus was thoroughly clean, could only come from the tubes. I observed that after the douche the tenderness was much diminished, and on making an immediate bimanual examination after a douche I was able to press on the exudate on both sides and cause pus to flow from the uterus. As all fetor had disappeared from the discharge and the tenderness had become bearable, I applied dry tampons of absorbent cotton covered with boric acid powder to the uterus and vaginal walls, first giving a vaginal injection, then gently massaging the exudate toward the uterus. These tampons were changed every twenty-four hours, the nurse pulling them out by the attached thread and giving a douche before my visit. The tampons gave such relief and support to the patient that she could move freely in bed, get up, and have the bowels act without pain. After a fortnight of this treatment the tumors formed by the matted tubes and ovaries, as well as the discharge, had diminished so much that the tampons were

changed every two days, and her progress to recovery was rapid. She regained her health, was able in summer to travel to Europe, and I again attended her in June, 1888, with her last child, now 5 years old. No puerperal complications ensued.

CASE VI. *Puerperal diphtheritis of vulva, vagina, uterus; endometritis; pyosalpinx; recovery; subsequent pregnancy without complications.*—Mrs. G., 23, married two years, normal menstrual history. I saw her in consultation on the eighth day with Dr. B., who had delivered her with twins at the seventh month. Patient was very low, tympanitic and tender abdomen, dusky hue to skin. Temperature 100$\frac{2}{4}$°; pulse 128, small, irregular; respiration 30. Physical examination revealed laceration of perineum to the sphincter, covered with gray, diphtheritic slough, swollen and reddened vulva, erysipelatous blush from vulva to thighs and groin. Lochia scant, foul-smelling. Antiseptic douche given. Bimanual examination then showed laceration, bilateral, of cervix; uterus enlarged, sensitive; large exudation at both sides, fixing womb. The finger introduced into the uterus, which was patulous, found shreds of placenta, decomposed blood, and a very foul discharge. A hot intra-uterine injection, 1:5000 bichloride, was given, the uterus thoroughly curetted, irrigated, and, the speculum being introduced, the vagina and the portion of cervix which was lacerated and covered with diphtheritic membrane were painted with carbolic acid and tincture of iodine, equal parts, the same solution being applied to the membrane in the vagina and vulva, and an antiseptic pad applied. Ice bags were applied to abdomen; ergot, nux vomica, and iron, and large quantities of whiskey and milk, given internally. After a preliminary rise the temperature gradually subsided. The vaginal and intra-uterine douche were used two to three times a day for ten days, when, the membrane having entirely disappeared, vaginal injection was alone given and iodoform applied to lacerations. When the patient was able to get up there still remained a thick, immovable uterus, with enlarged, distended, matted tubes and ovaries, which were treated by the hot douche, the boroglyceride tampon, counter-irritants to abdomen, and (as the pain prevented much exercise) by galvanic electricity. The absorption was slow, and as at times there was a flow of pus from the womb, especially on exercise, the patient, on the advice of her friends, consulted two eminent gynecologists, who advised the removal of the tubes

and ovaries, as she would never be better and the organs were useless and dangerous. She came back to me, as the pain was relieved while under treatment and she earnestly desired a child, being a Jewess. I treated her for two months, gave her tonics, kept the uterus well dilated, and the vaginal douche was constantly used. After the summer vacation she was so much better, discharge almost gone from her, uterus more movable, tubes less tender, I advised her to take her tonics and stop all direct local treatment. Her health improved, and she came to me in two years, pregnant at the seventh month, anxious about her accouchement. I delivered her with forceps of a nine-pound child, male, and there was no puerperal complication, and the pelvis is normal. She has been well for the last three years.

From an observation of these cases—and of the six cases narrated, three had been seen by eminent specialists, who had determined that nothing but operating could afford relief—and also from the practice of many specialists who curette the uterus, under antiseptic precautions, some time before celiotomy is done, with no bad results, even in pyosalpinx cases, I believe the following conclusions are fairly deducible:

1. That many cases of pyosalpinx are curable without mutilating operations, if the endometritis be treated by curettage and drainage with strict antiseptic precautions.

2. That true drainage of a pyosalpinx into the uterus is possible and does occur when the tubes and ovaries are on a level with the uterus, and the uterine end of the Fallopian tube is patulous, or can be made so by treating the uterus.

3. That uterine curettage and drainage should be practised in every case before operation, unless the tubes are very distended and thin, to cure the endometritis, which may and often is a cause of trouble and lack of relief after celiotomy and removal of the organs is performed.

4. That, even after pyosalpinx, frequently the tubes and ovaries are not useless organs, the proof being that pregnancy occurs and the puerperium is normal.

5. That only after proper treatment, the tubes, ovaries, and uterus remaining bound down by adhesions and a menace to life and health, should the radical operation be done.

6. As a matter of observation in large maternities, there are very few cases of puerperal complication due to the presence or results of a former pyosalpinx.

SUCCESSFUL CASE OF CESAREAN SECTION.

BY
H. W. FOSTER, M.D.,
Bozeman, Montana.

On February 13th I was called to see Mrs. D., German, age 28, primipara, who had been in labor since the morning of the 10th under the care of a midwife, who, seeing that labor was not progressing, had called in a physician. On the evening of the 12th the patient had been put under an anesthetic and craniotomy had been attempted, the physician satisfying himself as to the death of the child.

On examination I found considerable meconium coming away, which was somewhat offensive. The promontory of the sacrum was tilted forward, reducing the conjugate diameter of the pelvis at the brim to two inches, through which you could just feel the head of the child. There was so much tenderness that complete anesthesia was necessary before an examination could be made. I learned that it had been impossible to get her bowels to move, she having had repeated rectal injections, and salts and senna by the mouth. She was very much exhausted, pulse 135 and very weak. I at once decided to perform the Porro operation. She was put in as thorough an antiseptic condition as was possible, considering her condition and poverty, the family living in two small rooms.

I made an incision in the median line, commencing two inches above the navel and extending almost down to the pubis. The abdomen was quickly opened, exposing the uterus, through which an incision was made equalling the abdominal in length. The uterus was not lifted out, but the abdominal walls were kept pressed against it by an assistant.

I decided not to use an elastic ligature until after the womb was delivered of its contents, which was done as speedily as possible, with but little hemorrhage, the child weighing ten and a half pounds and having in all probability been dead forty-eight hours. While I was taking away the placenta, my assistant giving the anesthetic urged me to hurry, as the patient was sinking. So, on considering the utter hopelessness of the case,

as I thought, I decided to simply close the abdomen as it was. The uterus was united by a continuous Lembert suture of chromicized catgut, the abdomen thoroughly flushed with hot water, the peritoneum united separately in the same way, the abdomen closed with interrupted silk sutures and dressed with iodoform and gauze, a tight binder applied, and the patient put to bed. Hot-water bottles were placed about her, and she was given hypodermic injections of whiskey. She rallied quite well, and in about four hours I washed out the uterus and vagina with a strong solution of bichloride, finishing with sterilized water. About ten hours after the operation enemata of glycerin and half-tablespoonful doses of a saturated solution of sulphate of magnesia were given every half-hour to open the bowels; but it was not until the morning of the third day that I succeeded in producing an evacuation, the temperature then coming down from 101½° to 99°, and the pulse from 120 to 80. After this her convalescence was uninterrupted. The uterus was washed out daily with the bichloride solution until the sixth day, and on the seventh day I removed the abdominal sutures, applying two wide strips of adhesive plaster on a line three-quarters of an inch from the line of incision, containing eyelets, through which I passed a linen tape, and laced as one would a corset, thus giving additional support to the wound, which could be adjusted from day to day as the abdomen receded.

The patient was allowed to sit up on the sixteenth day, with instructions to wear the adhesive corset a couple of weeks longer.

TRANSACTIONS OF THE GYNECOLOGICAL SOCIETY OF CHICAGO.

Meeting of February 17th, 1893—*Continued.*

The President, DR. E. J. DOERING, *in the Chair.*

FOUR RECENT VAGINAL OÖPHORECTOMIES BY PROF. HENRY T. BYFORD.

Reported by DR. J. T. BINKLEY.

CASE I.—Mrs. C. E. A., Caucasian, housewife, æt. 44 years, married twenty years, one child 19 years old. Only pregnancy. Periods regular, slightly painful; marked constipation; pain upon

left side extending down into thigh; indigestion, frequent and severe headaches, and insomnia. Six or seven years ago had an attack of pelvic cellulitis. Diagnosis: prolapse of both ovaries, with chronic ovaritis. March 1st, 1892, assisted by Drs. McArthur and Kramer, at St. Luke's Hospital, both ovaries and tubes removed through an incision in cul-de-sac of Douglas. Temperature reached 100° once, and was nearly always under 99°. Discharged cured on twenty-fifth day.

CASE II.—Mrs. A. B., Caucasian, æt. 50 years; puberty at 16 years; married twenty-three years; has had eight children, eldest 20, youngest 10 years old. Had one miscarriage at seven months. Menopause at 48 years. Has a yellow, offensive leucorrhea; intense pain in back, pelvis, abdomen, and right hip. Sick since menopause. Constipated and passes too little urine. Diagnosis: ovarian abscess and pyosalpinx left side. October 15th, 1892, assisted by Drs. Binkley and Berry, removed ovary the size of an orange, also tube, through the vagina. Incision through median line posterior wall of vagina, abscess wall caught by two pairs of catch forceps, a canula thrust between them into the sac, fluid drawn, and sac and tube drawn through the opening, tied, and cut off. The vaginal incision partly sutured, forceps applied to some bleeding points, and iodoform gauze packed between forceps. Forceps removed in thirty-eight hours. In five days gauze was withdrawn; in fifteen days patient sat up, and left the hospital well at the end of thirty-four days. On day of operation temperature reached 101¼°; after three days it did not go above 99°, and recovery was without a symptom.

CASE III.—Mrs. M. M., Caucasian, housewife, æt. 27; puberty at 13 years. Menstruation regular, lasting five days, normal flow, no pain. Always felt fairly well. Enters hospital for sterility. Diagnosis: hydrosalpinx, inflammation, hyperplasia of right ovary.

November 17th, 1892, assisted by Drs. Binkley and Robinson, right ovary and tube delivered per vaginam, tied, and cut off. Patient sat up on fifteenth and left hospital on thirty-first day, recovering without a symptom, and is now enjoying perfect health.

CASE IV.—Mrs. M. E., Caucasian, housewife, æt. 34 years; married sixteen years; two children, no miscarriage; sick fourteen years. Menstruation regular every four weeks, continues a week, and is very painful. Pain in iliac and hypogastric regions, and backache. Bowels act regularly; sometimes has dysuria.

Two years ago had pelvic abscess and was operated upon for it. Diagnosis: small right ovarian tumor, left ovaritis, double salpingitis, and universal adhesions.

October 27th, 1892, assisted by Drs. Binkley and White, the tubes and ovaries on each side were delivered, tied off, and removed through the vagina. The adhesions were so extensive

and firm in this case that it was necessary to control some of the bleeding points with catch forceps, which were left on from twenty-four to thirty-six hours. The upper two-thirds of the vaginal incision closed. Drainage was provided for by carrying iodoform gauze up on either side. The gauze was removed in forty-eight hours. During first five or six days temperature remained below 100°, and then gradually rose, and on the twelfth day registered 103⅘°, indicating retention of secretions. The finger was introduced into the vagina, carried into vaginal incision, and a quantity of yellowish, offensive fluid evacuated and cavity washed out. All symptoms disappeared. After some days this train of circumstances repeated itself, drainage was re-established in the same way, and all progressed favorably again. But a third similar accumulation and retention of secretions occurred, and a small, self-retaining silver canula, devised for use in thin-walled abscesses, was inserted, and the patient went on to recovery, which has been slow and prolonged for the above-mentioned reasons. This case presented many grave complications—double pyosalpingitis of long standing, very extensive adhesions, augmented, no doubt, by previous operation —and shows clearly the main advantage of the method, the facility with which perfect drainage can be established without going into the abdomen. Similar conditions in abdominal section would no doubt have caused more serious sequelæ and probably, at best, chronic if not permanent abdominal fistulæ.

Dr. Byford prefers removing diseased ovaries and tubes and small ovarian tumors through the vagina because of the safety of the method and the absence of all trouble from hernia or abdominal fistulæ. All septic changes and retained secretions that would have resulted in general peritonitis have been invariably relieved by discharge through the vaginal incision, either spontaneously or after pushing the finger through the cicatrix, except in one case of pyosalpinx in which an infected ligature ulcerated into the rectum. Every case operated upon by Dr. Byford per vaginam has recovered.

Dr. Franklin H. Martin.—Dr Byford is certainly to be congratulated on the record he has made in the removal of ovaries, appendages, and small tumors by the vagina, but I do not believe his conclusions will be borne out by operators as a whole in regard to cases suitable for operation. In the removal of small ovarian cysts where there has not been peritoneal extension, or pyosalpinx without peritoneal extension caused by leakage producing peritonitis—in such cases the operation may be performed with some little difficulty, but it can be performed with safety. In cases of pyosalpinx with peritoneal extension and peritonitis, or extension and suppuration, what we would ordinarily call a pelvic abscess of considerable size or of ovarian abscess with extension to the peritoneum, I do, not believe the operation is a proper one to do. In the case given I cannot

agree with the report that the conditions would have been less favorable if the operation had been done by the abdomen. I believe if operation had been done by the abdomen the hemorrhage could have been easily controlled by the ordinary glass drainage tube, which could have been removed in twenty-four to forty-eight hours, and the case recovered, as hundreds of cases do, without fistula. The incision into the bottom of the vagina undoubtedly increased the hemorrhage at this point, and it was not entirely the result of the removal of the adhesions; in other words, if he had gone in above, the mass could have been enucleated without any difficulty whatever. The advantages of the operation seem to be first a cosmetic one; these patients are beginning to learn that Dr. Byford removes pyosalpinx and ovarian abscess—or the "ovaries," as they say—through the vagina without leaving a scar. That has been brought forward to me by patients, in at least three cases, as a great point in favor of that method. Another point is freedom from hernia; hernia will occur in very few cases after removal of the appendages through an abdominal incision, if the incision is properly made and properly united, as would be the case in Dr. Byford's hands. In fact, I doubt if he has ever had a hernia from an abdominal oöphorectomy. Those are two points in favor of the operation which occur to me.

A disadvantage is the difficulty in reaching the ovaries, even when they are movable and ready to be rolled out without any enucleation. Where peritoneal extension has occurred it is impossible to do the work except entirely by guesswork; it is out of sight, and therefore dangerous. I have noticed in Dr. Byford's work that his cases are properly selected, they are most of them favorable for that kind of an operation, and, where the cases are properly selected, certainly no fault can be found with it, leaving the cases proper for an abdominal incision for that operation.

Dr. F. Byron Robinson.—Dr. Byford is making quite a remarkable record of successes in these cases. I have watched him do some of these operations, and I am not altogether convinced that it is the best thing. The whole matter rests on the selection of the cases. The hemorrhage in these cases seems to me to be more dangerous than in abdominal section, and in this operation it is easier to make wounds in the intestine. In one thing the operation is more favorable than abdominal section—that is, after this operation women are not so likely to die from shock; the shock is not so great. A woman whose uterus is taken out through the abdomen receives a wonderful shock, but when it is taken out through the vagina the shock seems to be very much less; that must be due to the traumatism on the intestines or peritoneum. But I do not think Dr. Byford's operation is going to be the one for pyosalpinx. When I open the abdomen for pyosalpinx I find it difficult enough to get the organs out

when I have plenty of room. I think the whole point of this operation lies in the selection of cases. Of course the shock from vaginal hysterectomy resembles very much the shock from labor, while the shock from abdominal section is always grave enough.

Meeting of March 17th, 1893.

The President, DR. E. J. DOERING, *in the Chair.*

DR. CHRISTIAN FENGER read a paper on

APPENDICITIS.[1]

DR. F. HENROTIN opened the discussion with a paper entitled

ENTEROSTOMY AND DRAINAGE IN THE TREATMENT OF DIFFUSE SEPTIC PERITONITIS.[2]

DR. DANIEL H. WILLIAMS reported several cases of

INFLAMMATION STARTING IN THE CECUM AND VERMIFORM APPENDIX.

A very courteous invitation from your Secretary, Dr. Henry P. Newman, makes it possible for me to present a report of some cases which may be of interest and in keeping with the subject of the evening. It is not my object to be exhaustive, or, indeed, to take up the literature of the subject at any length, but simply to mention some of the practical points in the history, diagnosis, and medical and surgical treatment of inflammations starting in the cecum and appendix.

The first case presented to you is that of Mr. J. G., and is one of the type of which I have had three. It began as an acute catarrhal appendicitis caused by a foreign body, and ended in suppuration. The following is the case:

It was not seen until twelve hours before operation. The attending physician, a painstaking and careful man, had in the meantime diagnosed it as perforative appendicitis and urged an immediate operation. The patient, while at work some two weeks before, was attacked with sharp pain in the right iliac region. He continued to work for ten days after the first attack. When seen at his home he was in bed, lying on his back, right leg drawn up; temperature 102½° F., pulse 130, respiration 26; no nausea or vomiting; abdomen distinctly tympanitic; marked rigidity of right abdominal muscles; finger tips, nose, and ears cold; general tenderness in right inguinal region, from Poupart's ligament below to a line drawn from the anterior superior spine to the umbilicus. Greatest tenderness was over centre of the tumor, which was one and a half inches above the

[1] See original article, p. 161.
[2] See original article, p. 199.

anterior superior spine, on a line with the umbilicus. The tumor was irregular, resistant, and not well defined; skin over tumor edematous. He had that gray, tired, sallow, anxious look of sepsis which means much to the eye of the surgeon.

This case was admitted into the Provident Hospital in the evening, and the diagnosis of perforative appendicitis was confirmed by the associate surgeon. Small doses of whiskey every three hours, enema of glycerin and Rubinat water the evening before, and a strictly liquid diet were ordered, and the usual preparation made for operations of this kind.

The patient was brought to the table with a temperature of 103° F., pulse 140, respiration 30. There were present at the operation Drs. Fuller, Going, Bailey, Hall, Curtis, and Barr. An incision three inches long was made immediately over the tumor; peritoneum was found thickened; getting through the peritoneum, about two ounces of fetid pus were discharged. Necessary care was taken at this point not to break up the delicate limiting adhesions, so often found and so necessary to protect the peritoneum from general infection. The patient was turned on his right side to facilitate the flow of pus. Index finger was introduced, and a fecal concretion about the size of a small filbert was removed. A soft-rubber catheter attached to a glass tip from a slightly elevated fountain syringe was introduced and the cavity irrigated. The mesentery of the appendix was tied off with fine silk; the appendix, about as thick as an index finger, was ligated with silk and removed. The stump was touched with strong carbolic acid on a probe point, cavity packed with iodoform gauze, and patient removed to bed. At 8 P.M. same day temperature 100½° F.; 7 A.M. following morning, 99⅘° F. The temperature remained in the neighborhood of 100° F. for the three following days, when the patient had an ill-defined chill. The packing was removed, cavity irrigated with Thiersch's solution. Running upward from the bottom of the cavity there was a slight bulging that did not appear to communicate with the original abscess cavity. About two inches above the crest of the ilium an edematous, tender spot was located. The patient was returned to bed; temperature 100° F. Next morning patient was anesthetized. A vertical incision three inches long, the centre of which was over a painful spot (in the loin), was made; cutting through the lumbar fascia, a small quantity of pus escaped. The opening was enlarged and made to communicate with the original abscess cavity; a large drainage tube was placed from the inguinal opening through the opening in the loin. After irrigating with Thiersch's solution the cavity was packed with iodoform gauze; temperature at 8 P.M. 99° F., following morning 98° F. From this time on he had no untoward symptoms, and recovery was perfect in about five weeks.

The second case was as follows: Harry L., 8 years old, em-

ployed at the Union Stock Yards. July 10th, 1892, he was attacked suddenly with a chill. The next day he was seen by the writer, and the following observations were noted: Temperature 101° F., pulse 120; pain in right inguinal region, most tender one and a half inches below anterior spine, on a line with the pubes; tip of nose, ears, and fingers cold; abdomen moderately tympanitic; slight rigidity of the right abdominal muscles; bowels habitually constipated; a small tumor, one and a half inches from the anterior superior spine toward the pubes, was made out. Operation July 13th. Present at operation, Drs. Haskell, Black, Wesley, and Curtis. An incision three inches long was made, the centre of which was over the tumor. Small intestines presented. On cutting through the peritoneum and following the colon down to its junction with the ileum, the appendix was found to be about five inches long. It was large, red, and edematous. Incision was enlarged and appendix turned into the field of operation; the mesentery of the appendix was ligated with fine silk; the appendix was isolated and ligated close to the cecum; stump treated with strong carbolic acid on a probe point; the cavity was carefully sponged out, but not irrigated. This stump was very large and dangerous-looking, and from it I feared infection of the general peritoneal cavity. A piece of rubber tissue was placed against the intestines and iodoform packing was made to the surface. The wound was stitched up all but about an inch at the lower angle. In thirty-six hours this boy's temperature was normal. He did well from this on, and returned home from the hospital in twenty-two days.

The third case was as follows: Mrs. A., State street, age 46 years. June 14th, returning home from the city during the afternoon, she was attacked with a chill, followed by intense pain in the right iliac region. She was seen the same evening; found lying on her back, leg flexed on thigh and the thigh on the abdomen. Her bowels had been habitually constipated; temperature 104° F., pulse 120, and respiration 28; tongue coated in the middle and red on tip and sides; abdominal muscles rigid, moderate tympanites. A small, irregular tumor was found about an inch from the anterior superior spine of the ilium toward the median line; point of greatest tenderness, two inches above Poupart's ligament.

Treatment, glycerin enema, strict liquid diet, continued moist heat. Second day: Tumor increased in size; chill at 3 A.M.; one-sixth of a grain of morphine hypodermically. Third day: Tumor increased in size; increased tympanites; more pain; slightly œdematous two inches above Poupart's ligament. An immediate operation was advised. The operation being refused, other counsel was called. June 30th I learned that Mrs. A. had been taken suddenly worse on the 25th and died on the 27th. From what was learned from Dr. Burdick it seems

plain and reasonable to say that, starting from acute appendicitis, the case went on to suppuration, rupture, and death. A post-mortem examination was refused. There is little to be said of this case, as it was one of the results often seen where the appendix is primarily involved. It is not always that suppuration in connection with the appendix results fatally. Limiting adhesions wall off and protect the peritoneum, the pus finding its way to the surface by the least resistant route, where it ruptures, or an extraperitoneal operation can be done with but little danger. The only point in this connection is to exercise patience and care so that the limiting adhesions are not disturbed and the peritoneal cavity infected.

Of the next type or class of cases I have had five, all but one recovering without an operation. These are the cases which are causing a most bitter contention between the physician and surgeon—the physician on the one hand asking for time, the surgeon on the other ignoring time and pleading for immediate interference. There has been much warm contention between such conservative men as White of Philadelphia, Treves of London, Rand, Lange, and Gerster of New York, and some of the noted surgeons of our city who are present to-night—these men arguing against the practice of indiscriminate laparatomy for appendicitis. On the other hand, McBurney and Weir of New York, Cruikshank and Fowler of Brooklyn, and a host of foreign surgeons, accept no middle ground, claiming that the indications—such as sudden onset, high temperature immediately following, vomiting, localized pain and tenderness in the right iliac region, with or without the presence of tumor—are positive signs of the inflammatory involvement of the appendix, and that we have no means of distinguishing the cases which will go on to suppuration from those which will result in resolution; and they argue, therefore, with some reason, that early laparatomy should be resorted to, in order that, by ocular inspection of the parts, a correct diagnosis can be made and timely treatment afforded.

October 5th, 1892, Frank B. went home from his place of employment at 6 o'clock, ate his supper, and retired. At 11 o'clock he awoke with sharp pains in the right iliac region. He was seen at 11:30 A.M. October 6th, and the following observations noted: Age, 14 years; previous health good; no history of former attacks; rather inclined to lie on his back with the right leg drawn up; complained of pain if any attempt was made to straighten it; face flushed; tongue covered with a brownish coat; temperature 103° F., pulse 120, respiration 26; lungs and heart normal, except increased rate; urine, quantity not estimated, a large deposit consisting mostly of urates, otherwise negative; bowels constipated; persistent nausea, no chills; tenderness referred to right iliac region; on closer examination with the finger tips, the most painful spot was found

two inches below the umbilicus, one and one-half inches to the right of, on a line with, the anterior superior spine; rigidity of the right abdominal muscles; tympanitic over lower right abdomen; no dulness on percussion; pain in the region supplied by the lumbar plexus, thigh, abdomen, perineum, and testes.

Brought to face such an array of symptoms, the question one should first consider is, What are the contents of this region? The cecum and the appendix. What causes would give rise to such symptoms? An acute inflammation, known by its suddenness, tenderness, and elevation of temperature. What known factors will cause the inflammation? Two of the most prominent are infection and a foreign body. Studying abdominal and pelvic anatomy for the past six months with Dr. F. Byron Robinson, it was time and again demonstrated, as Treves had previously shown, that the cecum is entirely covered by the peritoneum, and, though it may not have a mesentery as the appendix has, it swings free in the peritoneal cavity, and inflammation in the cecum is very likely to reach its peritoneal covering, and not the cellular tissues in the iliac fossa. The cecum may be inflamed in association with a general colitis, or frequently from inflammation due to retention and impaction of feces. Inflammation thus started may extend into the appendix, and, by closing the opening from this into the cecum, give rise to an appendicitis by retention of mucus—a recognized cause of recurring attacks.

From a pathological point of view the cecum offers a ready explanation for mild and many recurring attacks, the cause usually being fecal impaction; but for the cause of those in which suppuration is most often met we must look elsewhere.

Prof. Sahli, in a recent observation, says: "These inflammatory conditions represent an infection of the cecum and appendix. Their severity depends on the actual cause of the disease, and the starting point does not explain their clinical picture. Non-perforating ones may run a severe course, and perforating ones a mild one. The division into typhlitis stercoralis and appendicitis is not tenable. The swelling which is felt in the so-called typhlitis stercoralis is not feces alone, but much more often an exudation and inflammatory infiltration. The question should be as to which cases ought to be operated upon, and not as to whether typhlitis should be treated by operation or not." In his extensive experience he does not agree with the eminent men of the surgical centres of Europe or with those in this country, that all cases should be operated upon, for it is by no means proven that the mortality is diminished by operating upon all cases without discrimination.

The first thing to decide in these cases, which bear such a close resemblance in their every aspect for the first two or three days, is to operate or not to operate. On this point the broad-minded physician and the conservative surgeon can meet with

much profit, for it is a very wise man who would operate in the first twenty-four hours on every case of inflammation starting in the cecum and appendix.

Treatment.—It was learned on the first visit that his mother had given him a tablespoonful of castor oil without effect. An enema of one ounce of glycerin and four ounces of Rubinat water was given at 11 A.M.; before 12 he had had a copious stool. At 8 o'clock the same evening another enema of the same kind was followed by another copious stool. Nausea and vomiting continued for thirty-six hours. This was relieved by small doses of magnesia sulphate and acetate of potash. For the pain, menthol dissolved in dilute alcohol was applied on a sheet of absorbent cotton. This gave immediate relief and satisfactory results. I have since used this on three cases of the same kind at the Protestant Orphan Asylum and two in private practice, with complete relief from the pain.

I cannot speak too highly of menthol for this localized pain. It was suggested by its well-known effect on local pain elsewhere. It might be suggested that the physician personally superintend the first application, or he may be disappointed in getting his patient properly relieved. Solid food of all kinds was prohibited, and an absolute liquid diet was maintained until the patient was fully convalescing. In one case hot poultices were used with some relief and comfort to the patient. After a few days they became an annoyance by their weight; light menthol dressings were substituted with complete relief during the rest of this illness. This patient returned to his place of employment in twenty-four days.

DR. W. W. JAGGARD reported

A CASE OF ABSCESS OF THE VERMIFORM APPENDIX CLOSELY ADHERENT TO RECTUM AND RIGHT TUBE, ASSOCIATED WITH DOUBLE PYOSALPINX; REMOVAL OF SAC AND APPENDAGES; RECOVERY.

Miss L. C., age 21, single, worker in a factory, was referred to me by her physician, Dr. J. A. De Vore, about the middle of December, 1892, with the following history: The patient had enjoyed fairly good health until four months previous to my seeing her. At that time, while on a visit to the Eastern coast, she suffered from a severe attack of pain in her right side, which confined her to the bed for four or five days. She did not consult a physician, as she considered her illness due to catching cold at her menstrual period and thought she would be all right in a few days. She acknowledges, however, to having had a high fever and of feeling very ill. She has never been free from pain in the pelvis since that time and has been unable to work. Five weeks ago she was seized with severe pain in the right pelvis and sent for Dr. De Vore. An examination revealed

a severe pelvic inflammation, which he treated with the usual remedies. There was considerable fever, pelvic pain and tenderness, and excruciating pain whenever the bowels moved. The local symptoms subsided sufficiently to enable the patient to walk about, but examination showed the pelvis filled with a hard, tender mass, for the relief of which condition she was sent to St. Mark's Hospital, and kindly referred to me.

An examination under chloroform, December 21st, revealed hard, nodular, and somewhat movable masses on either side of the uterus. The latter was crowded against the pubes and rather freely movable. The masses were closely adherent to the rectum. No fluctuation could be felt.

A celiotomy was performed two days later. The omentum was found closely adherent to the fundus of the uterus. This was carefully separated, and upon the patient being placed in the Trendelenburg posture the large intestine was seen running transversely across the pelvis and attached to the uterus and



broad ligaments by firm adhesions, completely shutting in the deeper portions of the pelvis. The bowel adhesions were carefully separated and the rectum exposed. The appendages were rolled up under the broad ligaments and densely adherent. In enucleating these masses an abscess sac containing about an ounce of pus was opened. This sac, which at the time was supposed to be an abscess of the ovary, was closely adherent to the rectum, from which it was peeled with extreme difficulty. The appendages were enucleated and removed and the stumps cauterized. The abdominal cavity was thoroughly irrigated with large quantities of sterilized water, and the abdomen closed after the insertion of a drainage tube.

An examination of the specimens proved most interesting. The left tube was greatly thickened and its lumen dilated and filled with pus. The right ovary was enlarged and intimately adherent to the tube. The abscess sac, which at the operation

had been considered ovarian, was seen to be attached to the outer extremity of the tube. Its diameter was about one and a half inches. A hole was discovered in the wall of the sac, through which a fine probe could be passed. This orifice, the walls of which were smooth, did not present the appearance of having been punctured. A fine probe could also be passed through the entire length of the tube. A good photograph of the specimen was obtained. The abscess sac was judged to be the dilated vermiform appendix, and this supposition is strengthened by the position of the bowel, observed at the time of the operation, and the history of the case. It is to be regretted that the nature of the abscess sac did not suggest itself at the operation, as it would have been interesting to note the condition of the gut.

The patient, with the exception of a slight purulent discharge which occurred in the course of the drainage tube, made an uninterrupted recovery.

DR. WELLER VAN HOOK.—In his study of appendicitis Dr. Fenger has taken the pathological point of view, which is the one we must take if we wish to attain a complete understanding of appendicitis.

It is the custom of many operators to break up adhesions in all cases of appendicitis and remove the appendix. After adhesions have been formed and the general peritoneal cavity has been fenced off from the source of infection, it seems to me that the Sonnenburg method of operation is the most reasonable and offers the patient the best opportunity for recovery—packing with iodoform gauze or stitching the peritoneum on the tumor surface to the parietal peritoneum. One such case came under my observation, where there was a layer of omentum between the tumor wall and the abdominal wall; and after stitching that layer of peritoneum to the parietal peritoneum the pus cavity was easily opened on the following day, and the patient made a good recovery.

It seems to me, in those cases where we are greatly in doubt as to the propriety of operating or resorting to medical treatment, we shall have to look to the future to give us an ideal knowledge of the pathology of the disease. Nothing has been said this evening in regard to the bacteriology of appendicitis and the peritoneal inflammations consequent upon it. A large variety of bacteria are doubtless to be found in different cases of appendicitis. The Bacterium coli commune has been found, and the characteristic inflammation that follows its introduction into the peritoneal cavity has been noted; and doubtless the ordinary pus microbes are frequently responsible for inflammation in the appendix. The number of bacteria that normally inhabit the appendix is immense. If we could, by examination of the urine for the excreted toxines or ptomaines produced by the pathogenic micro-organisms, determine what particular patho-

genic bacteria or class of bacteria were present in and about the appendix, we might find indications which would determine for or against laparatomy in these doubtful cases. This, of course, is a point we shall have to leave to the future to settle; but it is certain that a bacteriological study of appendicitis is much needed.

The suggestion to operate upon recurrent attacks of appendicitis, not during the interval, but at the time of the exacerbation, has been made also by Dr. Bayard Holmes, for the reason that the abscess cavity, being distended by pus and elevated toward the abdominal parietes, to which it would probably be found adherent, would be easily drained. So far as I know, there is no reason why, when the abscess surrounding the appendix has been thoroughly drained, it should not become cicatrized and the patient recover.

Dr. Henry Banga.—As to the indication for operation, I have come to the conclusion that I would not operate unless I could feel a tumor at the classical place. I have sometimes thought that in general peritonitis, especially that kind following laparatomies, what really kills the patient is not the inflammation or the infection, but mostly the difficulty in the action of the heart and respiration caused directly by the distention of the bowel. And if we add to this difficulty of the circulation and respiration the anxiety of the patient, the want of food, rest, and sleep, there are enough causes to explain why those patients die without infection.

I had made up my mind never to operate for appendicitis complicated with general peritonitis; but since I heard from Dr. Henrotin the good results he has had in opening the colon, I intend, in the future, to try the same procedure, not only in a case of appendicitis complicated with general peritonitis, but also in a desperate case of tympanites or peritonitis following laparatomy.

Dr. Van Hook speaks of stitching the abscess wall to the edge of the abdominal wound. I never saw an abscess wall that might have been stitched on. My first case was that of a boy about 6 years old. On the seventh day there was a circumscribed tumefaction, no general peritonitis. The father hesitated about consenting to the operation. Feeling satisfied that the tumor was adherent to the abdominal wall, I thought an explorative puncture could do no harm, and we agreed that I should make a puncture, and if I found pus I should operate at once. I got pus, and the father said: "Go ahead." After I had gone through the abdominal wall I was first puzzled by the fact that the tumor seemed very much smaller—so much so that I wanted to assure myself once more of the presence of pus. I inserted the needle in two different places with negative results. What puzzled me next was the entirely healthy appearance of the peritoneum, which showed that the abscess

had not become adherent, and I felt very bad about my reckless punctures. Yet the fact remained that by my first aspiration a drachm of pus had been withdrawn. I had to open the abscess. It seemed to me impossible to do it extraperitoneally, as the peritoneum right before me showed absolutely no signs of nearby inflammation, and as I was at a loss to know in what direction I would have to peel off in order to reach the abscess; besides, I ran the risk of buttonholing it somewhere at the bottom of the wound. I then opened the peritoneum, with the intention of going straight on toward the appendix. A loop of small intestine presented in the peritoneal wound, showing the signs of acute inflammation of its serous covering. I tried to push the bowel over to the median line, in order to keep as close as possible to the iliac fossa. The bowel, however, was adherent to the iliac fossa. Pressing the nail of my right index finger close to the iliac fossa, I began to peel the bowel off, when all at once I fell with the tip of my finger into an abscess cavity containing about two tablespoonfuls of matter mixed with blood. I washed the cavity out, dried it with iodoform gauze, and inserted a drainage tube. The boy got well in a short time.

Since then I have had three such cases, where, after cutting through healthy-looking peritoneum, I came across a loop of intestine fixed to the iliac fossa, which I detached with the finger nail, keeping laterally toward the spina ilei as much as possible, when all at once pus would well out. In no case did I find a "sac" to be sewed to the wound. After cleansing the cavity and inserting a drainage tube I considered the operation successfully performed. All patients got well. Should the diseased appendix present itself, I would, of course, remove it; but I would never search for it after freely opening the abscess. The logic of the operation is simply to lead the accumulated matter to the surface, thus preventing its breaking through into the general peritoneal cavity, thereby starting fatal general peritonitis.

Dr. Henry T. Byford presented specimens of

TWO FETUSES REMOVED FROM THE PERITONEAL CAVITY AT ONE OPERATION.

Truth is stranger than fiction. I have here two fetuses, at about the same stage of extra-uterine development, removed from the abdomen by one operation. They were apparently about four months old when they perished. The condition was complicated by a right hematosalpinx and a left hydrosalpinx.

Mrs. P. G., age 42 years, married twenty-five years; eight children, youngest 12 years.

Seven years ago went two weeks over her time; then, October 23d, 1885, had a slight flow of blood and was taken with most

severe cramping pains in lower abdomen, recurring again and again. Was in bed until December 10th, then got up and went to the office of Dr. W. H. Byford, who sent her back to bed for two weeks longer. Called on Dr. King, who prescribed ergot and caused the expulsion of something from the uterus.

Five years ago had a similar attack, commencing with cramps and fainting. The late Dr. J. S. Knox diagnosed a pelvic hematocele. Has been treating for diseased appendages almost ever since. Three months ago she had an attack of pelvic peritonitis with bulging in the cul-de-sac of Douglas. I apparently cured the attack by drawing off about five ounces of serum from the cul-de-sac.

Abdominal section February 21st, 1893, at the Woman's Hospital, assisted by Drs. J. T. Binkley and Marie White. Found the uterus and appendages matted together in a conglomerate mass the size of two large fists, with intestines adherent over them. Came first upon a hematosalpinx on right side, which burst and let out about four ounces of a bloody fluid. I then came down upon a membranous sac adherent in the pelvis, containing a fetus with bones well preserved. After tying off this side I found almost exactly the same thing on the left side, except that the tube contained a watery fluid. The adhesions were so firm that a portion of the cyst of the right ovary had to be left on an adherent loop of intestine, and the fetal sac of the right side had to be ligatured and a portion left on the rectum, to which it was adherent. No definite placenta was found. The operation was quite a bloody one throughout. Drainage for thirty-six hours. Unusually smooth recovery, temperature remaining below 100° F. throughout, excepting a temporary rise during the second week from a superficial stitch-hole abscess in the unusually fat abdominal walls.

This is another of the many cases that are being discovered in which extra-uterine pregnancy has not killed the patient. It is the second patient I have had with two tubal pregnancies, none of which produced any apparent dangerous symptoms. The condition has by no means the mortality attached to it that many eminent surgeons would have us believe. I know of no other case in which both tubes, each with a fetus, have been removed at the same operation. The history, together with the mummified appearance of the fetuses, would make it quite probable that one of the conceptions occurred seven years ago and the other five years ago; that each had caused a pelvic hematocele, had become encysted, and remained to trouble the patient ever since, but not to kill her.

He also exhibited an

INFECTED OVARIAN TUMOR WITH EXTENSIVE ADHESIONS REMOVED FROM A WOMAN FOUR MONTHS PREGNANT.

Mrs. H. T. S., age 38 years, married fifteen years; three chil-

dren, oldest 13 years, youngest 7½ years; two miscarriages, one soon after birth of first child and one three years ago. Pregnant four months. Pain in right ovary since birth of first child. An ovarian tumor the size of an adult head was diagnosed by myself a year ago. Operation advised and refused. Returned about February 1st, four months pregnant, with tumor but little increased. Ovariotomy February 11th, 1893, at the Woman's Hospital, assisted by Drs. J. T. Binkley and Marie White. Found a dermoid ovarian cystoma in the right iliac and umbilical region, completely embedded in old organized peritoneal, omental, and intestinal adhesions. During a tedious enucleation the cyst wall broke and emptied some fluid with a fecal odor and of the color and consistence of pus, which was carefully wiped out. The pedicle was quite long and was tied about one inch from the uterus. The abdominal cavity was flushed with hot water. As the uterus, enlarged from a four months' pregnancy, filled up the cul de-sac, two glass drainage tubes were introduced, a long one extending to the right lumbar region and a short one to the pelvic brim a little to the left of the median line. The peritoneum, muscle, and all layers of fascia sutured with a single row of silkworm-gut sutures. The subcutaneous fat, which was nearly two inches thick, and the cutaneous edges, were allowed to gape open unsutured. Dry absorbent cotton was laid between the raw edges. Drainage tubes out in forty hours. The cotton on the open wound was changed every four hours during the first few days, then four times daily, then three times, and finally twice daily. The sutures were taken out in two weeks. The wound has been dry from the beginning and the cutaneous edges have closed, so that today, five weeks from the operation, there is a narrow line of dry, glazed connective tissue along the line of incision. Nothing but dry cotton has so far been brought in contact with the wound. The temperature never went above 100.4° F., except at the end of the fourth day, when it went to 102.4° and was accompanied by vigorous and painful uterine contractions. One dose of morphine dispelled these and relieved the temperature permanently. Until the last ten days there had been a frequent return of abdominal pains without temperature, but always promptly relieved by one dose of morphia. They have now almost ceased to return.

The interesting features are the tolerance of the pregnant uterus to a severe abdominal operation lasting two hours, the apparently more than ordinary vitality displayed by the peritoneum during pregnancy, the method of suturing the incision in a fat abdomen by accurate suture of the peritoneum and fascia only, and the healing of the open wound of fatty tissue of twelve square inches of surface, without any cleansing or dressing except dry absorbent cotton, and without the occurrence of suppuration.

Dr. F. Byron Robinson presented a specimen to illustrate

GERLACH'S VALVE IN THE CECUM.

It is well known that men and women do not suffer from appendicitis to an equal degree. Bamberger, of Vienna, used to say that men had appendicitis six times as often as women. No doubt this is too high, but still any one who carefully watches persons who are attacked with appendicitis will readily observe that men are attacked much oftener than women. There is a kind of explanation why men suffer from appendicitis more frequently than women, and the specimen which I present to-night aids the explanation. If one examines a goodly number of bodies he may observe that the fold of mucous membrane which surrounds the mouth of the vermiform appendix varies very much in condition and size. In young men the fold of the valve appears quite large and almost closes the opening in the appendix. In old men the valve atrophies and leaves quite a wide mouth. This wide mouth is what allows old men to escape appendicitis. In women the valve around the mouth of the appendix is small and does not close the opening. Now, an appendix with a wide-open mouth will allow any foreign body to drop into it and also to drop out of it again, and in this manner no irritation will arise in the appendix. In the young man, with a long Gerlach valve closing the mouth of the appendix, the matter is quite different. Just as soon as a foreign body drops into the appendix through Gerlach's valve the irritation induces the mucous membrane to swell, and Gerlach's valve then closes the mouth of the appendix completely and no drainage is allowed. The result is an abscess or a collection in the appendix. Hence young men have more appendicitis than women, on account of the large size of Gerlach's valve in men. The valve is small in women and atrophied in old men.

Meeting of April 21st, 1893.

The President, Dr. E. J. Doering, *in the Chair.*

Dr. L. Hektoen.—I wish to narrate two instances of peculiar

LESIONS CONNECTED WITH THE VERMIFORM APPENDIX

which I observed post mortem. One instance occurred in a man with a fecal fistula opening in the right groin below Poupart's ligament. He had been operated upon in Germany for an inguinal hernia. An operation was made for the fecal fistula, which terminated fatally. The post-mortem examination showed that the fistula was due to a patent vermiform appendix lying in the inguinal canal, the opening in the appendix being at its free end.

The second instance of peculiar lesion about the appendix is

somewhat similar to the one cited by Dr. Jaggard at the last meeting, as illustrated by the specimen shown by Dr. Holmes at a meeting of this Society two or three years ago. In this case, as in the one of Holmes, the appendix was adherent to the rectum, and there was a fistulous connection between the appendix and the rectum. In addition there were in my case adhesions binding the appendix and the rectum to the right ureter, and also an opening into the right ureter. Through this opening an ascending ureteritis and pyelonephritis had occurred.

Dr. T. J. Watkins.—I have one or two cases I would like to put on record. One case is somewhat similar to the case reported. There was present an inflamed and dislocated left Fallopian tube, which had become attached to a suppurating mesenteric gland. The gland contained about one drachm of pus, and in separating the adhesions and removing the necrotic tissue the intestine was slightly opened. Two or three Lembert sutures were inserted and no difficulty resulted. If this case had not been relieved it would probably have terminated in an abscess which would have communicated with the intestine.

Another case was a young boy 15 years old. He had the usual enlargement at the head of the cecum seen in perityphlitis. The abscess was opened and drained without infecting the peritoneal cavity. When flushing out the abscess cavity a capsule was washed out, about the size of a three-grain quinine capsule, which was as hard as stone. It was afterward learned that the capsule had been given to the boy three weeks before for constipation. It had probably been in the house for three months.

In another case the abscess was located in the median line in front of the uterus. The sac of the abscess consisted almost entirely of omentum. The patient had had an inguinal hernia, which for some years had not troubled her. It had always been reducible. She was running to catch a train when she felt a very severe pain in the median line just above the pubes, and following she had elevation of temperature, severe pain, and the formation of the abscess described. The abscess communicated with the bowel.

Dr. H. P. Newman.—In regard to the relative frequency of appendicitis in male and female, I believe, with Dr. Jaggard, that it is not so much greater in the former as has been supposed. The reason why the affection appears to be more common in the male is undoubtedly due to the fact that it is not so easy in male cases to mistake the diagnosis as in females, where we have so many pelvic troubles with symptoms not unlike those associated with appendicitis.

I have twice had the misfortune to operate on advanced cases in the male after the abscess had broken into the peritoneal cavity and the patients were in a state of collapse. In both

cases they promptly died after the abdomen had been opened and all possible measures taken for relief. One of these patients was said to be suffering from typhoid fever, and the other was simply "suffering"—without any diagnosis. I did not see either of them until after the stage of collapse had been reached. It is to be feared that such instances of mistaken diagnosis are not rare, and we know it is not infrequent, in doing laparatomies or operating for pelvic troubles in the female, to find disease of the appendix. So it seems to me that if it were possible to compile our statistics with any degree of accuracy we should find that this disease manifests little partiality for either sex.

Dr. L. L. McArthur.—I regret I did not hear the paper. I am, therefore, unable to discuss it. I would like, however, to say something in regard to a number of cases of appendicitis that I have had, and from which I have made some deductions which I hope will coincide with the experience of Dr. Fenger.

I have had thirty-five cases of appendicitis requiring operation. These thirty five cases were subdivided into acute suppurative appendicitis, gangrenous appendicitis, and catarrhal appendicitis. Of the acute appendicitis cases, twenty-three in number, all recovered with simple opening of the abscess. The operation in the majority of these cases was done between the fifth and ninth days, the earliest in the third day of the symptoms of abscess. In every case it was possible to open the abscess extraperitoneally because of the tumefaction enabling one to locate the point of greatest induration in nearest proximity to the abdominal wall; and if the incision chanced, as it did in two cases, to overlap the peritoneal adhesion, a stitch or two of fine silk enabled one to close the peritoneum before opening the abscess proper.

From these cases, all recovering by opening the abscess without removing the appendix and thus endangering the patient from extravasation into the general peritoneum of the infective material which these abscesses contain, I have concluded that it is wise not to attempt to remove the appendix when floating in the abscess cavity. In three cases I have washed out, by simple irrigation, the appendix in the form of a slough. As the majority of these were hospital cases, I have not been able to follow them for a long period of time. I know, however, that but two of them returned to me for a second operation—that is, with symptoms of the return of the trouble. In one case that returned six months after recovery from first attack, with symptoms of commencing new abscess, I was called at midnight to the hospital, and, eighteen hours after the first symptom, opened the abdominal cavity with the idea that I could at that early period get into the neighborhood of the appendix and remove it before the general abdominal cavity would be endangered by the escape of pus. On making the incision through the perito-

neal lining of the abdominal cavity, the latter was found bathed in pus, and the patient died in three days. In the other case a sinus formed beneath an old cicatrix, and by simply washing it out for a few weeks it got well. Of the ten cases on which I operated where the abscess had already broken, the patients all died. Where the general peritoneal cavity was bathed in pus, no amount of careful washing and sponging, no use of Mikulicz tampon, or any method of treatment, enabled me to save these cases.

Of the gangrenous cases of appendicitis I have had but one. I was called in consultation with Dr. Wing during the second twenty-four hours of the attack, the patient being in a state of collapse, with a subnormal temperature, and apparently moribund. As a last resource it was determined to open the abdominal cavity and see if the diagnosis was correct, and, if possible, do something for him. The diagnosis was ruptured appendicial abscess. No tumor could be felt over the classical area. No fluid in the abdominal cavity, indicated by the change of position, but on opening the abdomen the appendix, after a little feeling for it, was brought up with the caput coli and found in a bluish-black condition, which was probably strangulation through an inflammatory action at the neck of the appendix. Ligation of the appendix was practised, and a simple collar of peritoneal covering reflected over the ligature. This patient made a good recovery. It surprised me in these cases that the gangrenous appendix, lying as it did loose in the abdominal cavity, had caused no lymph exudate, had apparently not obstructed the other tissues against which it lay, but simply made a condition of profound toxemia.

Of the three cases of recurrent or catarrhal appendicitis that I had, all were operated upon in the interval between the attacks. All had a history of having three, four, seven, or more attacks of pain, slight tumefaction, temperature, and distress, that caused their physicians to send them to this city and to the hospital for operation. In the cases operated upon between the attacks the appendix was always found thickened and indurated; its muscular and mucous coats under the microscope showing a marked thickening and induration, and between the muscular and mucous coats a large deposit of fibrous tissue.

I wish to mention another case of appendicial amputation which was peculiar in that the inflammation and the thickening had been induced by the pressure of a truss that was used to keep back an appendix which formed the contents of a hernia. I operated on this child for a hernia. A peculiar sausage-shaped, blunt-extremity tumor formed the hernial contents, lying in the inguinal canal much like a slender cigar; it would slip back nearly out of the canal when pressed, but immediately pressure was removed would slip down into the canal again, and after a while the conclusion was reached that it was an appendix, and this was ligated and removed.

It was shaped like a cigar, but was more nearly the size of a fountain penholder, was about three inches long, and its anatomical structure was like that of an appendix and terminated in a blind sac. Microscopical section showed it to be like the structure of the appendix, long and slender, but markedly thickened compared to the normal appendix.

From this experience, which has been rather a fortunate one for one so young in the practice of surgery, I have come to these conclusions: 1. That there is in cases of appendicitis a period of choice as to when to operate. Cases in which the symptoms of appendicial abscess are present sufficiently to require it should be operated upon, in my opinion, within the first twenty-four hours, or, if that be passed, wait until the formation of the tumor, and especially the formation of adhesions strong enough to form an abscess wall; waiting until the fifth, sixth or seventh day, unless the temperature ranges very high, the toxemia is great, and intestinal obstruction and vomiting symptoms are marked, when, of course, we infer that the contents of these abscesses are under great pressure and there is great danger of the abscess breaking, and to avoid that danger a somewhat earlier operation should be made. 2. I have also come to the conclusion that an effort should be made to open the abscess without opening the abdominal cavity, when feasible, which I think is in the majority of cases. 3. That the point of incision should be over the point of greatest flatness on percussion. 4. That the line of incision, so far as subsequent hernia is concerned, makes but little difference, if one be careful to approximate the surfaces in stitching up the wound to the point in which the drainage tube is inserted. To avoid hernia in these cases I have a number of times separated with the handle of the scalpel the fibres of the external oblique in their direction, and the fibres in the internal oblique and transversalis in their direction, in that way making a simple separation in the muscular fibres, and not cutting them, so that when relaxed they fall back into their place again, and the abdominal wall is not weakened by cutting them. This is in many cases feasible.

While the point raised by McBurney as being the point of greatest tenderness is accepted now as being a classical symptom, I think the point may vary greatly from a point midway between the umbilicus and the anterior superior spine.

I would say, in answer to Dr. Robinson's remark as to the gangrenous appendix, I believe the appendix was in a state of impending gangrene; it was only thirty-six hours from the commencement of the trouble that the appendix was removed. Certainly the circulation was so disturbed by constriction at its attachment that it had been completely cut off. It was a bluish-black color, such as the toe assumes before it begins to dry up with gangrene; it had produced all those symptoms which accompany gangrene in the abdominal cavity. There is nothing

more frightful than the effect of commencing gangrene in the abdominal cavity; and inasmuch as the man was supposed to be dying, we opened the abdominal cavity. His pulse was 140 to 160, there was cold perspiration, the temperature was down to 96°. We thought it was a ruptured abscess and that we could do something by washing out the abdominal cavity; in another twelve hours or more it would probably have made a complete gangrene and certainly caused death.

Dr. F. Byron Robinson.—There is one point I wish to speak of, and that is in regard to gangrene being found in the abdomen with recovery. Several years ago Dr. McBurney, of New York, published a list of cases of appendicitis on which he operated. I frequently noted that Dr. McBurney recorded a gangrenous appendix, ligated it off, and the patient recovered. I am inclined to take exception to the doctor's interpretation. I think that in those cases the appendix was highly congested and edematous, but not gangrenous. If one will take one of these dark pieces of tissue and wash out the venous blood, it may be frequently observed that the tissue remaining is quite normal in appearance. It must be accepted that an appendix lying *free* in the abdominal cavity, without adhesions and gangrenous, is rare, and still more rare that a patient will recover after the removal of a gangrenous appendix. Gangrenous tissue lying in the free abdominal cavity is almost always fatal. Dr. McArthur also reports a case to-night of gangrene of the appendix, and that around the appendix there were no adhesions, and that he ligated it off and the patient recovered. I would very much like to have seen that appendix put into clean water and the black blood washed off. I am inclined to think the operator would have found simply a congested, edematous appendix. Gangrene of any tissue in the abdominal cavity is very rare with recovery of such patient. Dark-colored tissues are not always gangrenous. When tumors are twisted off their pedicles they do not gangrene in the abdominal cavity. The irritation produced on their surface and in the surrounding organs induces local exudates, which organize and support the tumor. I have performed laparatomies where the tumor was entirely twisted off its pedicle and caught up and nourished by the omentum. Gangrene in the abdominal cavity nearly always comes from tapping, and occasionally through the digestive and genito-urinary tracts; but rarely with recovery. I will risk my reputation on the idea that gangrene occurring in the abdomen with successful operation and recovery is more rare than reports will show. I am fully aware that the appendix is not infrequently found detached from its root, and that it must have fallen off from a suppurative or a gangrenous process; but in such cases it is not free in the abdominal cavity, but has been hemmed in by adhesions. The old abscess in which the appendix dropped has been absorbed down to an old cicatricial adhesion. That is a limited gangre-

nous process. In my experience the so-called classical McBurney point in diagnosing appendicitis is about useless. The disease is where the pain and exudates are. Personal work in the dissecting room and post-mortems would indicate that the appendix hangs in the pelvis in twenty per cent of women. How, then, does one expect to get pain and tenderness midway between the umbilicus and anterior superior spine of the ilium? The appendix may be under the liver, in the pelvis, in the left iliac fossa, or in the so-called normal position. Pain and tenderness will be found wherever the appendix allows the infection to escape.

I saw a girl of about 15 last night. I think she has appendicitis. There is a lump, about the size of a cocoanut, on the left side. The hymen is intact, and, so far as we know, the tube is all right. McBurney's point is not a particle of good.

Another thing I am highly in favor of is the incomplete operation. If there is appendicitis and you do not find the appendix very easily, let it alone; it may not be polished surgery, but they get well. The relation of pelvic diseases to the appendix is getting clearer every day. The appendix often infects the pelvic organs; that is common. I have seen that in Tait's operations, where he had a great number of them. Once in a while the appendix would be adherent to the broad ligaments, and there is no doubt that the pelvic organs are frequently infected through the rectum or gastro-intestinal tract.

Dr. Christian Fenger, in closing the discussion, said: In regard to all the interesting material that has been brought out I shall make only very brief remarks.

Dr. Williams and also Dr. Jaggard have called attention to the occasional occurrence of multiple but separate accumulations of liquid exudate, and this fact is of the utmost importance at the time of operating. It would seem in such cases that the operation in the free peritoneal cavity would be preferable to the localized operation.

If we cannot make the diagnosis, however (as Mikulicz could in his chronic case), should the patient with a single cavity be subjected to the same treatment as the patient with multiple foci? This, it seems to me, is one of the barriers to our action, now insurmountable, but which may in the future be removed as our clinical knowledge increases.

Dr. Williams' second case, with sudden exacerbation, attended by collapse which could not have been prevented, might be considered as an argument in favor of indiscriminate early operation.

I fully agree with Dr. Jaggard as to the difficulty of differential diagnosis between appendicitis and pelvic suppuration from salpingitis. Many cases cannot be diagnosed until the time of operation or at the autopsy. The operative treatment, however, should be the same: opening through the vagina or

rectum in chronic cases, and laparatomy in acute cases. In both appendicitis and salpingitis the removal of the offending organ is desirable. Opening and drainage may bridge over the acute danger in the limited accumulations and permit a radical operation under more favorable circumstances later. The removal of the appendix or tube through the free peritoneal cavity, in cases where the inflammation is as yet limited, exposes the majority of patients to a danger greater than that of non-operative interference followed later by simple incision. In the acute stage, where laparatomy is demanded, it does not make the operation much more extensive to search for the appendix.

To Dr. Van Hook's complaint that the clinical aspect of this question was not adequately considered, I would reply that it is difficult in an article to paint a clinical picture of any value as regards the differential diagnosis between localized and non-localized, suppurating and non-suppurating, inflammation around the appendix. This can be done only at the bedside.

Sonnenburg's two-tempo operation, which Dr. Van Hook advocates, was occasionally resorted to long before Sonnenburg's paper was written. It has not been used to any extent by other operators, and Sonnenburg himself has abandoned it. In the majority of cases of perityphlitic abscess it is unnecessary. The cases of acute spreading peritonitis require immediate operative treatment to relieve sepsis, and the two-tempo operation with an interval would not be advisable.

Dr. Henrotin is to be congratulated upon his successful operations in the two desperate cases he mentioned. He has raised an important question in the entirely new proposition of making an opening in the cecum to evacuate gas and feces, and thereby to obviate the danger of tympanites and at the same time to drain the peritoneal cavity. This is important if it will help a patient with diffuse peritonitis to a recovery which might not otherwise take place. We know that some patients with gangrenous hernia, or perforation into the hernial sac, get well when this is opened and an artificial anus established, but we do not know how much peritonitis those patients who live really had. The artificial anus is an incumbrance, but if it will save life it is justifiable.

Dr. McArthur in his extensive experience has followed about the same plans and has had about the same results as other operators. The cases of diffuse peritonitis died, and the localized peritonitis patients recovered and were operated upon without regard to the appendix.

I fully agree with Dr. McArthur that the operation should be done within the first twenty-four hours in the few desperate cases, or should be deferred until the storm is over in the great majority of ordinary cases. The difficulty of early operation is that in a large number of these cases the onset is so gradual

that it is impossible to say when the acute symptoms which indicate the time for operation commence.

If we follow Sonnenburg's classification and consider the fatal cases as hopeless diffuse peritonitis, and the non-fatal cases as localized but possibly later diffused—that is, as so many lives saved—then the prognosis of early operation is good. But this is a somewhat artificial method of argument. Who knows how many of the non-fatal cases would have recovered without operation, or whether some of the fatal cases would not have recovered if operation had not been resorted to?

Avoidance of hernia by separation of the abdominal muscles is certainly a good plan, and has been employed, for instance, in gastrostomy. I cannot see, however, how this could be done except in the localized cases in which the opening is small.

Dr. Robinson is to some extent right in his statement that gangrene is extremely dangerous and that it is probably less common than is ordinarily supposed; but partial gangrene of the appendix is exceedingly common. No process will take away part of the appendix, except gangrene, and we often find cases in which part of the appendix is gone. The entire appendix has been found in several cases in the abscess cavity. Consequently gangrene does not necessarily cause death nor does it prevent limitation of the disease.

In conclusion, it seems to me, after going through the literature on this subject, that the gulf between the advocates of the early radical, and later more conservative, plans of treatment is not so wide as it appears. It is rather the accentuation or drawing forth into prominence of one or the other side. All agree that light cases need no operation. No one of the advocates of early operation will operate upon every case he meets, but he accentuates the early cases. In like manner the conservatives give especial prominence to the operation in severe cases only, and to the fact that so many patients recover without operation. But when it comes to the individual case there will probably be only slight dissension as to the line of action to be pursued.

Dr. F. Byron Robinson presented a specimen of the

UTERUS OF A MULTIPAROUS SOW,

which demonstrated Gärtner's duct very beautifully. The duct courses from a point near the ovary, along the uterine horn, and is lost on the vagina. The duct is as large as a lead pencil and is very tortuous. It will be noted that the continuous duct is interrupted by atrophy of several segments. The thread of evolutionary development is best caught up by examining the lower animals for vestigial remnants of fetal life. Gärtner's duct represents the segmental duct of the mesonephros, and the vertical tubules of the parovarium represent the uriniferous tubes of the middle kidney. I have seen Gärtner's duct in woman as

large as a child's head, and it is common to see one of the vertical tubules of the parovarium enlarged (after a girl is 15). The sow and cow show Gärtner's duct typically. I have seen Gärtner's ducts end on each side of the ureter, and I could insert my little finger into their mouths. There is but little doubt that Skene's ducts are the ending of Gärtner's ducts. I have examined the genitals of over three hundred sows, and they present a very great variation in regard to the persistence of Gärtner's duct. Occasionally it persists almost entire for three feet, but usually is irregularly obliterated by absorption. I never saw a swelling in this duct as large as a common marble in three hundred and fifty sows. It is curious to note that the genitals of a sow vary very much. The ovaries are of all sizes, from a bean to the size of a turkey egg. The ovaries lie in a distinct pouch of peritoneum, into which the enormous, wide mouth of the fimbriated end of the Fallopian tube ends. The ovules of a sow can hardly escape getting into the tubes, as they fall into the peritoneal pouch, and the mouth of the tube opens directly into the pouch. The pig gestates in the horns of the uterus, and has a universal placenta, while man's is discoidal. The Fallopian tubes are very small, hard, and tortuous. Curiously enough, I cannot find in literature, nor can good veterinary physicians tell me of, a single authenticated case of tubal pregnancy in the lower animals. The cow and monkey very closely approach man in structure of tubes and ovaries. The monkey's ovaries which I examined were so like the human that I could see no difference, except in size.

Dr. Ludwig Hektoen read a report on a case of

VITELLINE DUCT REMAINS AT THE NAVEL.[1]

TRANSACTIONS OF THE SIXTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Held in Detroit, Mich., June 1st, 2d, and 3d, 1893.

(*Abstract.*)

The President, Lewis S. McMurtry, M.D., *of Louisville, in the Chair.*

Dr. Geo. F. Hulbert, of St. Louis, Mo., read a paper entitled

[1] Will appear in the September number.

INTRA-UTERINE ASPHYXIA, WITH REPORT OF THREE CASES.

The first case was delivered in a perfectly normal way by natural force; the two subsequent ones were instrumental. In all of them he was certain that he heard the fetal heart not longer than one-half hour before delivery was accomplished; heard it distinctly, but somewhat weakened in its force. At the time of delivery in all, the appearance presented by the children as they came through the vulva was one of extreme pallor, with slight if any evidence of cyanosis, save a deepened tinge of the lips with absolute muscular relaxation. The hearts were pulsating at the rate of from 40 to 50 per minute. The usual methods of artificial respiration were resorted to in all, to the extent of introducing the catheter into the trachea and thereby insuring a passage of air into the bronchial tree and alveolar spaces. That the air did penetrate was further evidenced by the slight crepitus easily heard during compression of the chest in the expiratory part of the respiratory act. Artificial respiration was maintained until the heart ceased to respond to the stimulus presented by the aëration of the blood. In none of them were there any external evidences of pathological conditions, development having been well accomplished. The umbilical cords were normal, and it was only when the placenta was reached that there were any conditions present that might possibly account for the peculiar condition of the children. Here in all three cases there were found blood clots occupying the placental surface in over half of its area. These clots were well formed, intimately attached to the placental tissue, smooth upon the uterine side. There was nothing indicating the fact that the clot had been torn from the uterine surface, but rather that placental separation had taken place and the clot had formed and become adherent to the placental tissue. So far as the mothers were concerned, they were in average good health; the first primipara, the last two multiparæ. The labors were of not over twelve hours' duration. The pains were not sustained and vigorous in any of them, but rather short and inefficient. In none of these cases was chloroform used, and in only one, the first, was a rectal injection of twenty grains of chloral given during the first stage; the compression upon the head was not at all excessive and would not have attracted attention. In the last two cases there was no pulsation appreciable in the cord; in the first case he had no record of this fact. The children were separated from the mothers immediately, and in the first a small amount of blood was permitted to flow through the severed end of the cord. Unfortunately in none of them did he obtain a post-mortem, and, as before stated, the only anatomical lesion that he could testify to is the presence of the blood clot occupying an extensive part of the area of the placental surface. There was only a moderate amount of the amniotic fluid; dilatation

was well advanced before the membranes ruptured; in the last case rupture occurred at the beginning of dilatation. The points for consideration in the above are:

(*a*) The presence of the fetal heart pulsations so soon before delivery. (*b*) The normal character of the labor. (*c*) The extreme pallor and relaxation of the child at birth. (*d*) The presence of the cardiac pulsation after delivery. (*e*) The absence of any attempt upon the part of the child to perform the respiratory act. (*f*) The response upon the part of the heart to artificial respiration. (*g*) The anatomical conditions presented at the placenta.

Dr. William H. Wenning, of Cincinnati, read a paper entitled

PLACENTA PREVIA: A STUDY OF ITS PATHOLOGY.

The pathology of placenta previa is far from being definitely settled, owing to the discrepancy between clinical phenomena and anatomical demonstrations. The term originally meant simply the fact of the after-birth lying before, which might apply to a prolapse of the placenta as well as a primarily low insertion. At the present day it implies a fixation of the placenta to the lower pole of the uterine cavity. Omitting minor points of discussion, the placenta may be said to be previa when it is inserted wholly or in part to that portion of the lower uterine segment which is subject to distention in pregnancy or labor. In accordance with this definition, the locality and amount of implantation will further determine the variety or form of placenta previa.

The typical variety is that known as central placenta previa, although the placenta rarely is found implanted in such a manner that the centre of the placenta corresponds to the centre of the inner os uteri. A better term would be placenta previa totalis, or complete placenta previa. By partial placenta previa is meant a condition in which placental tissue covers the os internum only in part, so that whilst a portion of the placenta overlies the os when dilated, the larger part is attached to the side of the uterus, hence an incomplete placenta previa. Because it is attached to the side of the uterus it is also called lateral placenta previa.

By marginal placenta previa is understood simply a low insertion, but sufficiently high that its margin reaches to, but does not cover, the os internum. The last two are often regarded as synonymous, although the clinical features are entirely different. Some confusion is caused by this want of conformance by different authors in defining the last two varieties—partial and marginal—properly. The writer thought that the terms central and partial should be dropped, the former because the placenta is very rarely exactly central, the latter because it does not clearly express the anatomical relationship to the uterus, and the

terms total and partial, or, still better, complete and incomplete placenta previa substituted. Furthermore, central and lateral are used more in reference to the clinical than anatomical situation, to express the amount of hemorrhage.

The same terms are not applicable with the os dilated. For instance, a central (total) placenta previa in which nothing but placental tissue can be felt through an os but slightly dilated might become lateral (partial) with full dilatation, because at this time the membranes could be felt alongside of the placenta.

From all this he concluded that a true understanding of the fact could be arrived at only from an anatomical standpoint. Formerly the pregnant uterus was considered merely as a hollow, muscular organ divisible into two parts, the body and cervix, the former contracting, the latter dilating in labor. Separation of the placenta could take place only by contraction of the body or dilatation of the cervix. But as contraction of the uterus under normal circumstances occurred only during labor, detachment of the placenta previous to this period could be only *accidental;* but dilatation of the cervix was a necessary event in the beginning of labor, and with those who believed in the actual shortening of the cervix in the latter months of pregnancy the placenta became *necessarily* detached, hence the terms accidental and unavoidable hemorrhage of Rigby, Levret, and others.

The writer then showed the inexactness of these definitions, because, first, every hemorrhage before labor, even that from placenta previa, would have to be classed among the accidental; and, secondly, because accidental hemorrhage, as defined by Rigby, could occur only if a placenta was normally inserted, whereas we know that there must be some predisposing cause for the spontaneous separation of the placenta. Then, again, when it was demonstrated that the cervix remained closed until the onset of labor, and that the shortening was apparent rather than real, no physiological reason could be assigned for hemorrhage from placenta previa during pregnancy. To add to the confusion, Duncan, who did not accept the actual shortening of the cervix, described all hemorrhages in placenta previa that occurred previous to labor as accidental. For this reason, as these terms had lost their original significations, they should be dropped.

The investigations of Müller, Lott, and Bandl on the anatomy of the lower segment of the uterus in the latter months of pregnancy threw a new light, also, on the anatomical condition in placenta previa; but, as Bandl maintained that the lower portion of the uterus was in part made up of the cervix, the *unavoidable* feature was again explained, until, still more recently, the demonstration that the formation of the decidua was limited by the os internum and did not cover the cervical portion, hence

the cervix did not contribute to the formation of the lower uterine segment, the original question was again opened.

The writer was therefore of the opinion that a definite understanding of the morphology of the uterus in normal pregnancy and labor was necessary to appreciate the conditions in placenta previa.

The uterus of gestation is divisible into three parts in advanced pregnancy, the upper and lower segments of the body, and the cervix. As the cervix is only operative in labor, the anatomical changes in the body interest us most in pregnancy. The most important feature is the ring of Bandl, because it divides the uterus into two segments physiologically distinct from each other. But in order to study the implantation of the ovum, and, consequently, also of the placenta, it is convenient to subdivide the upper segment into two portions, the upper or fundal, and the middle; and below this lies the lower uterine segment, between the ring of Bandl and the os internum. This would correspond to the fundal, equatorial, and cervical zones of Barnes. Barnes seems, however, to make the division of the first simply arbitrary, but the writer suggested that all of the portion of the cavity above the uterine insertion of the oviducts be termed upper or fundal, and the zone below this line and above the ring of Bandl, middle or equatorial. The writer regarded this distinction as important, because it concerned the question of primary implantation of the ovum. He was of the opinion that the impregnated ovum, when it entered the cavity, was most apt to be caught in the decidua *below* the insertion of the tubes and *above* the ring of Bandl (or what would later on correspond to this circle), and *that this is the normal implantation;* everything above and below is abnormal; hence the extremes of the poles of the uterus are not the normal habitat of the ovum. In placenta previa this was self-evident, because it is universally recognized that the lower the implantation the more previa the placenta will be. In the upper or fundal wall the clinical features are wanting, but a careful examination of the rent of the membranes after labor would show that the placenta is situated very rarely just opposite this point.

If the ovum strike the most dependent part, which afterward becomes the lower or cervical zone, we will have the lowest insertion of the placenta—a placenta previa totalis. If it fall not quite so low, but at a point near or upon the border line of that ring which afterward becomes the contraction (Bandl's) ring, the placenta will invade partly the middle and partly the lower zone—a partial or incomplete placenta previa. If implantation occurs above the ring of Bandl and to the sides of the uterus, we have a truly lateral implantation of the placenta, but not previa. Hence the reason for discarding the term "lateral placenta previa."

When the ovum becomes attached to the fundus of the ute-

rus the insertion is fundal, but, owing to the anatomical relation of the tubes to the cavity, and the influence of gravity when the ovum reaches the womb, the writer looked upon fundal implantation as rare. He regarded it not so much a question of partial or total implantation, as the fact that the placenta develops primarily in the lower uterine segment, which is borne out by the clinical symptoms.

In the early months of pregnancy, the area of implantation being small, the placenta will develop for a while in conformity with the growth of the womb; but if attached to the lower zone a limit of expansion will be reached and the one of two things must happen: either rupture of the placental tissue, or, more commonly, separation from the uterine wall takes place, followed by hemorrhage.

In labor the largest portion of the uterus is drawn upward from the fetus. Above the contraction ring the uterus is contracted, or, rather, retracted; below it, greatly distended. In placenta previa with continuance of dilatation each pain detaches new portions of placenta. It is not so much the descent of the placenta as the ascent of the uterus that characterizes the change of situation. As long as the placenta can follow the uterus in its upward retraction, little separation can occur; but if the placenta cannot follow the uterus, the latter is drawn away from the former and hemorrhage results.

This is the philosophy of action of the bag of membranes. When the amniotic sac remains intact to the very end, the placenta cannot follow the uterus; but if it be ruptured before the period of complete retraction, the placenta can follow the uterus, for a while at least, in its upward course, by which further detachment is postponed.

In short, the whole mechanism is explained by the three properties of the parturient uterus: contractility and retractility of the upper segment, dilatability of the lower segment.

The writer then enumerated various other theories at length, but concluded that for the present the theory that the development of the lower uterine segment explains the clinical and anatomical features of placenta previa, and that placental separation is the result of expansion of this portion of the uterus, is most rational and satisfactory.

Dr. James F. W. Ross, of Toronto.—The different theories that have been advanced regarding the cause of abnormal implantation of the placenta have been thoroughly argued by the essayist, and it is difficult to say which one is the best to pin our faith to. My own ideas regarding the subject are that there must be some very close connection between the frequency of the production of the left occipito-anterior presentation at a later period of life and the peculiar normal implantation of the placenta. The doctor holds that the upper implantation is as abnormal as the lower. I think the most frequent implantation

of the placenta is that described by him as on the side of the uterus, in the middle zone, running up into the upper zone.

Dr. William W. Potter, of Buffalo.—I am a little disappointed because the author did not enter into the treatment of placenta previa. I know that I express the views of the members present when I say there can be nothing but admiration for the splendid manner in which he has presented the pathology. We would like to have Dr. Wenning's views in regard to the management of these cases, so that this phase of the subject can be taken up in the discussion.

Dr. George F. Hulbert, of St. Louis.—The author of the paper spoke of the cause of the abnormal implantation of the placenta. The only point I wish to make in that respect is the possible explanation of why we have various phases of placental implantation: that the real element in it is simply the question of nutrition. The usual understanding of the process is that the ovum is projected from the opening of the Fallopian tube into the uterine cavity; that it is immediately cared for by the hyperplastic mucous membrane or covering which has been denuded partially from the superficial layer of epithelium, and the nutrition is insured simply on account of the resistance between the peculiar tissue upon the outside of the ovum and the tissue presented by the mucous membrane in the cavity of the uterus.

Dr. John C. Sexton, of Rushville.—I would like to know if there is a different feel to the cervix, either through the os or external to it, by which one can be guided as to which side or other of the cervix the smaller implantation of the placenta may be.

Dr. Wenning.—I am glad the doctor asked that question. It is practically impossible to tell with positiveness which side is implanted. We only have our clinical experience to guide us. In a great number of cases the smaller implantation is to the left; consequently it is better to proceed toward the left in dissecting than to the right.

Dr. John M. Duff, of Pittsburg, read a paper entitled

THE CARE OF PREGNANT WOMEN.

Dr. Edmund M. Pond, of Rutland, Vt., read a paper on

DILATATION OF THE CERVIX FOR DYSMENORRHEA,

in which he advocated the use of a light Palmer dilator and packing the uterus when the cervix was elastic, this to be repeated if necessary. If this failed a heavy dilator was to be tried. But in cases where the cervix was long, conical, and cartilaginous, after the above method had failed, the free division from the internal to the external os, dilatation with a light instrument, and introduction of a stem to be worn from ten to

fourteen days, was to be recommended. Considering the good results from dilatation, it was the duty of every physician to at once relieve stenosis of the uterus, even in young girls, for it caused years of suffering at menstruation, with gradual increasing symptoms indicating congestion of the uterus and appendages; and if this condition was allowed to go on, the irritation from retained secretions in the uterus and tubes, and the congestion, would in time produce permanent disease of the appendages.

Dr. J. Henry Carstens, of Detroit, agreed with the author's conclusions and the necessity of treating cases early. We have all seen various symptoms as the result of stenosis, not only dyspepsia, but most marked nervous, epileptic, and hysterical phenomena, relieved by dilatation. The inevitable result of such obstruction finally causes disease of the uterine appendages.

I must disagree with the author in regard to his method of treatment by cutting. I do not see why we should cut any more than we should tear for the relief of this condition. The trouble is not in the mucous membrane; it is in the submucous tissue, and some of the muscular fibres contract and cause spasm. The mucous membrane can be stretched, without being torn, by means of a dilator. Cutting into the mucous membrane is liable to cause septic absorption from the raw surface.

Dr. Howard W. Longyear, of Detroit.—Very much can be gained by dilatation without adding the danger of septicemia from scarification, and I do not practise the latter at present. In regard to packing with gauze, I was in the habit at one time of doing this after dilatation, but I found my patients almost invariably had a rise of temperature twenty-four or thirty-six hours thereafter until I took out the gauze. Since I have been using a self-retaining hollow stem pessary my patients do not get a rise of temperature, and I follow that practice at the present time.

Dr. James F. W. Ross, of Toronto.—There are many cases of dysmenorrhea that cannot be cured by dilatation alone. I have dilated, packed, curetted, and used pessaries in cases, and still found that the dysmenorrhea has continued. The women have subsequently married and become happy mothers of live children. I think there is danger, perhaps, in the profession to overtreat dysmenorrhea. It seems as natural for some women to have pain during menstruation as it is for others to have an increased flow during the menstrual period. I am opposed to the use of the stem pessary. Many a pus tube began subsequent to the use of a stem pessary. I see no objection to its use for a short time, but to allow it to remain in the uterus for a long period is not a safe procedure. I think frequent dilatation will answer every purpose without the danger that is inherent in the stem pessary.

Dr. J. Henry Carstens, of Detroit.—Please explain how the presence of a silver or rubber stem pessary in the uterus will cause septic trouble.

Dr. Ross.—I remember, while I was with Mr. Tait, seeing one case in which a rubber stem pessary had been applied. Mr. Tait said: "This is the last time I will use a stem pessary. I was tempted to do it in this case." The patient's pelvis was matted together with inflammatory adhesions, and Mr. Tait attributed the inflammation to the use of the stem pessary. I consider that it irritates the parts, just as a silver sound will irritate the urethra in the male. If you tie a silver sound through a stricture in the male you will have a good deal of irritation; if you tie a silver catheter in the bladder you will have a good deal of irritation. I believe it is due to irritation of the tissues.

Dr. Longyear.—I agree with Dr. Ross that a pessary should not be left in indefinitely.

Dr. M. Rosenwasser, of Cleveland.—Dr. Ross has spoken about the use of dilatation of the cervix for dysmenorrhea. As in other operations in the office, it is to be condemned for the reason that we cannot make a careful pelvic examination unless we put the patient under an anesthetic, and if an anesthetic is to be given I prefer to do the operation at home rather than at the office. I find in a great many cases after dilatation that the stricture returns from time to time, and you have to dilate again and again, whether you use electricity, sound, or dilator.

Dr. L. S. McMurtry, of Louisville.—I think the principles on which the treatment of dysmenorrhea and displacements of the uterus by dilatation of the cervix is based, and the treatment of nervous conditions, are altogether faulty. In discussing the subject we seem to lose sight of the analogies that obtain in certain pathological conditions. When it was the fashion to treat dysmenorrhea and stricture a great deal by the use of dilators, when the dilator was as much in fashion as the curette and gauze packing are to-day, we were told that dilatation of the cervix would cure almost everything. Nervous women, women with hystero-epilepsy, were told that they could be cured by dilating the cervix. I see few cases every year where I think there is anything to be accomplished by using the dilator. I very rarely use it. I have used the stem pessary, and I quite agree with Dr. Ross that it is a harmful instrument.

Dr. William W. Potter, of Buffalo.—While I am prepared to admit and to agree with the President and some others who have spoken with reference to the fact that the dilator, like so many other instruments used in the interior of the uterine cavity, has done much harm by setting up violent pelvic inflammation which has resulted in matting of the tissues, yet I believe there is a class of cases which are amenable to treatment by the dilator in proper hands. I think that that class of cases was delineated in a measure by Dr. Ross when he referred to hyperesthesia of

the lower segment of the uterine mucosa, where we understand the internal os uteri to be located. It is not a stricture, but it has been sometimes so termed, and the word has led to much controversy. I do not believe that it is analogous to stricturous tissue elsewhere. I believe the word "hyperesthesia," or an excessive sensibility of that region, is the correct term. The nerve ends are overcharged with sensitive elements. I have demonstrated over and over again clinically that moderate dilatation of the cervix for dysmenorrhea in neurotic women, described as badly nourished, and yet not quite reduced to the extreme condition which the picture the essayist drew would indicate, is followed by improvement, and finally the dysmenorrhea disappears.

Dr. George F. Hulbert, of St. Louis.—The conception that dysmenorrhea is due to a stricture is responsible for the methods of treatment that we have had advocated to some extent in Dr. Pond's paper, and which are largely practised to-day by a great many gynecologists. I am satisfied, from investigations in the dead-house extending over a period of ten years, in which I had an opportunity of examining over one thousand uteri, that the condition of stenosis of the uterine canal in the lower segment is one of the rarest conditions that ever occur in that organ. In 1890, at a meeting of the Mississippi Valley Medical Association, I presented a paper on "Mechanical Obstruction," in which I dealt with this idea of stenosis of the cervical canal. Those who have the conception that the disturbance is not a mechanical one, but is a functional one and is resident within the tissue, cannot accept the practices that have been advanced in the past in regard to treating those conditions whose symptomatology is simply that of dysmenorrhea.

I agree with Dr. Pond in regard to the judicious use of the dilator, and that consists in what may be termed physiological exercise of the tissues. At the time the instrument is used, as soon as resistance is appreciated to any great extent we should stop, allow a few moments' rest, then try it again.

Dr. X. O. Werder, of Pittsburg.—There are two factors in the production of dysmenorrhea. One is an infantile or badly developed uterus, and these cases usually begin with dysmenorrhea. At the beginning of puberty they complain of pain at the time of the menstrual period. Then we have another class of cases that are perfectly free from pain for the first three or four years, after which they begin to complain of it at the time of the menstrual period. The first class of cases are benefited by tonic treatment, fresh air, exercise, and the like. In the other class of cases the symptoms do not appear until three or four years after puberty, and we find that it is endometritis that produces dysmenorrhea in them. Frequently these cases are accompanied by stenosis due to swelling of the mucous membrane. In those cases the use of the dilator is good treatment, not so much by

stretching the stricture as by producing drainage and relieving the endometritis.

Dr. Pond (closing the discussion).—I do not wish it to be understood that I resort to the knife in those cases that can be cured by dilatation. An examination should be made first to make sure that there is no serious disease of the uterine appendages; and if after the use of a light dilator we find the dysmenorrhea still continues, and the cervix is of a dense nature, where the muscular fibres are almost cartilaginous, then I think the knife will accomplish more than the dilatation. But in the majority of cases a light instrument will bring about the desired result where the cervix is patulous.

Dr. Eugene Boise, of Grand Rapids, Michigan, read a paper on

THE NATURE OF SHOCK,

in which he discussed the prevailing theory that shock is a paresis of the vaso-motor nerves, and drew the following conclusions:

Shock is not a paresis, either partial or general, of the vaso-motor nerves, but is a hyper-irritation of the entire sympathetic system, because:

1. The skin is pale and livid by reason of the contraction of the arterioles, because of stimulation of their vaso-motor nerves.

2. The heart's action is rapid by reason of stimulation of its sympathetic nerve supply.

3. There is scanty secretion of urine by reason of contraction of the renal arteries, the result of stimulation of their nerve supply.

4. The skin, though pale and livid, is bathed in perspiration by reason of stimulation of the secretory nerves of the glands.

5. The pupils are dilated by reason of stimulation of their sympathetic nerve supply.

6. The pulse at the wrist, while rapid and small, as would be expected in vaso-motor stimulation, is soft and very compressible by reason of the very scanty relaxation or dilatation of the heart.

7. The condition of the heart may not have been actually demonstrated, but may justly be inferred by analogy, reasoning from the action of the uterus under similar conditions. Each contraction of the uterus is normally followed by a period of perfect relaxation, as is the heart. Over-irritation or stimulation of the uterine ganglia or sympathetic nerve supply causes rapid contractions with very imperfect relaxation. It is fair to infer the same condition in the heart under similar causation. Thus the supply of blood thrown into the arteries is scanty and blood pressure is low.

8. The first five of these conclusions are justified by well-known experimental demonstration. The sixth and seventh are fair conclusions by reasoning from analogy.

9. That the condition of the heart is one of stimulation rather than paresis may be considered demonstrated by the fact that in cases of sudden death from severe shock the heart has been found contracted and empty. Admitting the correctness of this pathology, it follows that our treatment should be on the line of sedation to the sympathetic system, as by nitrite of amyl, nitroglycerin, morphine, and the application of moist heat, first, to the surface; second, through the long tube into the colon; and third, transfusion of saline solution at a comparatively high temperature.

DR. WALTER P. MANTON, of Detroit, read a paper entitled

A CONTRIBUTION TO THE PATHOLOGY OF SURGICAL DISEASE OF THE GALL BLADDER.

The chief purpose of this paper is to present the history and post-mortem find in a case of diseased gall bladder and ducts. The patient whose history is given was an inmate of the Eastern Michigan Asylum, where he had worked on the farm and enjoyed the privileges of an open-door cottage. Several months previous to his demise he had developed a jaundice, but remained otherwise well. Three weeks before his death it was noticed that he was growing weaker, and he was therefore transferred to a hospital ward. A few days later he had a severe chill, followed by several dark-colored, watery evacuations. Previous to this his stools had been wanting in coloring matter, but the urine had been loaded with bile. No tumor in the region of the liver could be found, but a mass, taken to be the large lobe of the liver, could be felt extending a hand's breadth below the margin of the ribs. The patient failed rapidly, and a herpetiform eruption appeared on his lips, eyelids, and anterior nares. These blisters were filled with bloody serum, and, breaking down, formed repulsive crusts.

The post-mortem examination showed a plastic peritonitis in the right hypochondriac region, which glued the omentum, transverse colon, and coils of the small intestine into an almost inseparable mass. The gall bladder was enlarged and contained about two ounces of a somewhat grayish, viscid fluid, and one small, friable stone. Its outer coats were much thickened, but several ulcerated spots on the interior surface had so thinned the wall at these points that the bladder ruptured during removal. The cystic duct was free for nearly an inch from its distal opening, but at the gall-bladder end a firm, fibrous wall, quite one-eighth of an inch in thickness, completely shut off the duct. The hepatic duct was much enlarged and contained a tumor one and one-eighth inches in diameter. Microscopical examination of this growth showed it to be of a carcinomatous nature. The common duct was about normal in size.

The entire absence of symptoms, except jaundice, in this case

made a diagnosis impossible and all operative treatment out of the question until the patient had become too far reduced.

Dr. James F. W. Ross, of Toronto, followed with a paper entitled

A FEW PRACTICAL NOTES ON THE ESTABLISHMENT OF ANASTOMOSIS BETWEEN THE GALL BLADDER AND INTESTINE FOR OBSTRUCTION OF THE COMMON DUCT, WITH THE RELATION OF A CASE OF OBSTRUCTION OF THE COMMON DUCT BY SMALL GROWTH.

He said that, after reports of work done by Gaston on dogs and by other operators on the human subject, he determined to operate on the first suitable case that presented itself. The differential diagnosis between malignant growth obstructing the common duct and the obstruction by stone of the same duct could not be made. He related a case of obstruction by a calculus mistaken by himself for one of malignant obstruction, and then related the history of the case upon which he based his remarks.

The case was that of a woman only 26 years of age, with all the usual symptoms of obstruction of the common duct, and with a history of the sudden onset of pain a year before the jaundice became intense. She improved and was apparently well in the meantime. A distinct nodule could be felt one and a half inches below the tip of the ensiform cartilage and a little to the right of the median line. The lump was small, smooth, and partially movable. A distended and movable gall bladder could be readily made out in the right hypochondriac and right lumbar regions. Operation was performed in two stages; the gall bladder was opened and washed out, and fastened to the abdominal wall. The wound required reopening in forty-eight hours for secondary hemorrhage from the cut surface of the right rectus muscle. The patient bled at the nose and spat blood. The wound healed by first intention. Notwithstanding this fact, the nodule was found, by needling, to be a small growth as large as a small walnut, and not a stone. The diagnosis could only be made by means of the needle, even after the abdomen was opened.

After the cholemia had disappeared an anastomosis was attempted by means of the elastic ligature. As bile did not come away in the feces, as expected after the lapse of a sufficient time to allow the ligature to cut through, a probe was passed and readily found an opening through the gall-bladder wall, but no gas or feces came through it. The little finger was passed into the gall bladder, after dilating the fistula through the abdominal wall, and the opening in the gall-bladder wall could be felt. Through this a small sound, about No. 20 French, was readily passed, but no bile appeared in the feces. A little blood now

began to streak the discharge of bile; this gradually increased, until after some days hemorrhage from the gall bladder became alarming. In spite of the styptics and packing of the gall bladder with gauze, the patient died.

He said one other case had been reported by Bardenheur, in which the elastic ligature had failed to produce the fistula. He had himself produced obstruction of the intestine of a dog after establishing anastomosis, and had found the lumen unobstructed, the anastomotic opening almost closed, and the silk ligature hanging in the interior of the bowel some weeks after. He would in future use the direct suture.

The post-mortem examination revealed the fact that the secondary manipulation had been practically extraperitoneal owing to the presence of limiting adhesions, and no signs of peritonitis were present. The fistula through the gall bladder opened in among dense adhesions just over a firm adhesion of the duodenum to the gall bladder. Any opening in the duodenum made by the elastic stitch must have healed; no trace of the stitch could be found. The hemorrhage apparently came from the liver or the bile duct in the neighborhood of the growth.

He concluded, firstly, that the best method of producing anastomosis is direct incision and direct suture with free drainage; secondly, that it is better to divide the operation into two stages, cholecystotomy and relief of jaundice, and cholecystenterostomy at a subsequent period; thirdly, that in many cases of large stone in the common duct it is better to leave the stone *in situ*, to do cholecystotomy, and then follow it up with cholecystenterostomy by direct suture after the cholemia had disappeared.

(The two papers were discussed conjointly.)

Dr. L. H. Laidley, of St. Louis, cited a case in which the principal symptom was a condition of jaundice, the tumor being readily felt underneath the thin walls of the abdomen. Operation was done, in which union was made about the duodenum and that of the gall bladder, and the parts were united by Brokaw's rings. The great amount of hemorrhage with which he had to contend was the cause of the patient's death. He believes the hemorrhage came from the mucous surface of the sac itself, and not from the margins of the sac.

Dr. C. A. L. Reed, of Cincinnati.—This is the first time I have had demonstrated to me the existence of intracystic neoplasms. They may be very misleading and send us on a hunt for calculi that do not exist. The question of anastomosis between the gall bladder and some section or segment of the intestinal tract is one of great practical interest, and I believe that wherever it is practical to effect such an anastomosis it ought to be practised in all cases in which there is either a large calculus or considerable growth, if the two can be differentiated at this stage

of the operation within the common duct. I have given some attention to the practice of anastomosis, not clinically, but experimentally, and I am satisfied it is an operation, as Dr. Ross has stated, that has come to stay. The ordinary anastomosis can be done quickly and easily, without a particle of danger, from the margin of the incision, by the Murphy button; and the nature of the device is such as to preclude the possibility of hemorrhage, for the reason that it exercises that pressure upon the terminal vessels that will prevent the oozing.

(Dr. Reed demonstrated the *modus operandi* of the Murphy button. He exhibited three different sizes of the button as made at present.)

Dr. L. H. Laidley.—I would like to ask if any of the members know of a case successfully operated upon in the human being other than those reported by Dr. Murphy.

Dr. Longyear.—Dr. H. O. Walker, of this city, has had a case of intestinal anastomosis in the human being in which the use of the Murphy button was successful.

Dr. Manton (closing the discussion).—The chief point of interest to me in this class of cases is the diagnosis. From what I have been able to ascertain from the literature of the subject, there seems to be no general symptom by which this condition of malignancy can be diagnosticated. We may have unmistakable disease of the liver present without having any trouble with ducts or gall bladder itself; so that unless some symptom is discovered by further investigation in this class of cases, it will be exceedingly difficult for the surgeon to know when *he shall* and when *he shall not* operate.

Dr. Ross (closing the discussion).—I cannot advise the use of the elastic ligature, and I should hesitate before using Murphy's button, for the reason, it seems to me, we are introducing into the intestine a large foreign body. Dr. Laidley tells me that two cases operated on in St. Louis in which the button was used both terminated fatally. If I should be fortunate to have a case of this kind to do I should first of all open the gall bladder, drain, get rid of the condition of cholemia; second, operate by secondary operation and produce anastomosis by direct suture. I believe it will answer every purpose.

(To be concluded.)

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Stated Meeting, April 27th, 1893.

H. J. BOLDT, M.D., *Chairman*.

THE PRACTICAL SIGNIFICANCE OF SHORTENING THE ROUND LIGAMENTS

was the general subject for discussion of the evening. It was opened with a paper by DR. JAMES E. KELLY,

THE ANATOMY OF THE ROUND LIGAMENT.

Dr. Kelly gave a lucid description of the anatomy of the round ligament, with special reference to Alexander's operation, and clearly demonstrated the anatomy of the parts by drawings, dissections, and model. The round ligament really was not round. It would be more appropriate to speak of it, in connection with its coverings, as the cord. It arose from the anterior surface of the uterus, and passed outwardly in the direction of the internal abdominal ring, which it entered, there being attached to it peritoneum. After entering the abdominal walls it passed downward, inward, and forward, and, diminishing in size, finally became indistinguishable from the surrounding tissues at a varying distance above the pubes, sometimes passing down to the labium. The author dwelt upon the fact that the inguinal portion of the abdominal walls was divided into three strata, the middle stratum, consisting of three layers, being attached to the ilium, Poupart's ligament, and the pubic bone. They were the external oblique; the internal oblique and transversalis, which united and formed the conjoined tendon as the cord finally made its exit through them; and the transversalis fascia. The cord received attachments from these parts, from which it must be freed before traction upon it would draw the uterus up. The genito-crural nerve accompanied the cord a part of its distance. In Alexander's operation, after exposing the cord near the pubic spine, it should be freed from its fibrous coverings, and then traction should be made upon it as nearly as possible in the direction which it took from the uterus toward the internal ring, upward, outward, and forward. Dr. Kelly briefly passed over the steps of the Alexander operation, which he divided into four: 1. Opening the canal. 2. Finding the cord. 3. Freeing the ligament and drawing the uterus forward. 4. Fixing the ligament and closing the wound.

Finding the cord was one of the easiest procedures in surgery, as it was accomplished with certainty by raising the structures lying at the floor of the canal with a hook or the finger nails. The third step, or freeing the ligament from its attachment and drawing it forward, was really the essential step of the operation, and it should be remembered that the other substances going to form the cord must be divided or torn before the ligament could be pulled forward, lifting the uterus. He had never failed to find the ligament, but at times it was brittle and broke easily.

Dr. F. W. Johnson read the second paper, upon the subject of the practical significance of the Alexander operation. It included a list of one hundred and eighty cases of the Alexander operation done in Boston hospitals, dating from December, 1889, to March, 1893. In a great many of the cases the result was perfect when the patients were discharged, and had remained so in most of those seen later. The operation had been severely criticised both here and abroad, but he thought the criticisms were based on theoretical grounds, or had been made by those without sufficient experience to judge fairly of the operation or its results.

The indications for the operation, as given by Dr. Johnson, were: 1. Uncomplicated retroversions and retroflexions where the patient was desirous of getting rid of the pessary. 2. For the cure of retroversions and retroflexions where the uterus or ovary prevented the wearing of a pessary. 3. For the cure of retroversions and retroflexions with prolapsus in second degree, and in procidentia when doing plastic operations. 4. In some cases of retroversion or lateral displacement with adhesions, breaking up the latter by aid of laparatomy or without—cases with fluid excepted. 5. Hernia. While witnessing several dissections he had been surprised how clearly the inguinal ring had been closed when the round ligament was drawn out, and this suggested the Alexander operation for inguinal hernia, and he had practised it with excellent results. 6. Small fibroids.

The following objections had been offered to the operation: 1. That the round ligament was often absent. 2. That there was great difficulty in finding it. 3. That it was a dangerous operation. 4. That it prevented the natural course of pregnancy. 5. That after pregnancy the uterus returned to its former malposition. 6. That it might give rise to serious secondary difficulties. 7. That it was limited in its application. 8. That it would soon become obsolete.

The author had never failed to find the ligaments, except in about his first case, and he did not doubt they were present in that instance. The difficulty of finding them depended entirely upon the experience of the operator. The beginner was apt mistakenly to suppose that he must recognize all the structures down to the ligament. He should have some fixed and easily

recognized landmarks. As to the danger, Alexander had operated eighty-four times without a death. In Boston a large number of operations had been done, with, as far as he had learned, only three deaths. The author had operated one hundred and seventy-five times, with two deaths, one from sepsis early in his experience, the other from pneumonia on the sixth day—a mere coincidence. A sloughing wound was not uncommon, but its frequency diminished with experience. He had never known intra-abdominal symptoms to result from pus in the wound.

Dr. Johnson then gave the details of preparation of his patient, which were as thorough from beginning to end as for a case of celiotomy, the cleansing and antiseptic process implying the use of corrosive sublimate solution, permanganate of potash, ether, soap and water, iodoform, and iodoform gauze; in case of suppuration, peroxide of hydrogen. The cleansing and disinfection were extended to the vagina, and gauze was introduced into the uterus. The patient was kept in bed two weeks, the sutures being removed at the end of a week. If possible, the catheter was dispensed with. The bowels were moved on the third day, then every day.

Dr. George M. Edebohls agreed with Dr. Johnson that it would hardly be possible for any one to give a more lucid description of the anatomy of the round ligaments than had been done by Dr. Kelly. As to the indications for Alexander's operation given by Dr. Johnson, they were broader than he had acted upon thus far, but he thought it quite possible they would hold good in practice. A main indication with him had been retrodisplacement of the uterus, movable, tubes and ovaries of normal size and free or only slightly adherent. Another main indication was prolapsus of the ovaries along with retrodisplacement of the uterus. Enlarged ovaries and tubes with adhesions contra-indicated the operation because of the danger of freeing the adhesions. He had abandoned the Alexander operation in uterine prolapsus; for while it was successful in some cases where the prolapsus was of the second degree, in others it was not, although done in the same manner. He had never done the operation in hernia, but thought it might prove successful where the hernia was dependent upon dilatation of the internal ring.

He had done the Alexander operation in sixty cases, finding one hundred and twenty ligaments. In one other case he gave it up after failing to find the round ligament on one side; but he could not say it was lacking, although he thought it was atrophied, as the woman had passed the menopause. Three times the ligament had pulled out of the uterus, so that he immediately opened the abdomen and performed ventral fixation.

In operating he made a free incision down to the tendon of the external oblique, almost in the same line mentioned by Dr.

Johnson, the points chosen by him being an inch above the middle of Poupart's ligament and the spine of the pubis. As it had been his custom the past three years to open up the inguinal canal, the next step in his operation, after finding the external ring, was to introduce a director up to the internal ring, generally an inch and a half, then slit the canal on this director. With the hook the muscular fibres of the internal oblique were then lifted, when the cord would be seen with its investing sheaths. The latter were stripped from the round ligament, after which traction would pull directly upon the uterus. The reflexion of the peritoneum upon the ligament would, however, come with it, unless it were stripped back at the internal ring with the finger as the ligament was being pulled out. This procedure stopped when the uterus was felt at the internal ring. The same steps were followed on the other side, and finally the ligaments were fastened and the wound closed. The manner of closure, he thought, made the occurrence of hernia impossible, while the method of opening up the canal possessed the advantages over the other method that the ligament could always be readily found, and that it could readily be divested of its coverings and the peritoneum be stripped back at the internal ring as the ligament was pulled out, drawing the uterus up. Sometimes the ligament did not extend outside the external ring, and in that event the method of operating by opening the canal became at once evident.

What gave him confidence against the occurrence of hernia was the fact that he closed the entire incision made in the tendon of the external oblique, at the same time securing the ligament with each suture passed through the tendon, usually putting in five to seven silkworm sutures along the canal, cutting them short and burying them. In all his last forty cases except one there had been primary union, no sloughing. In drawing the uterus up he relied entirely upon the ligaments, putting no instrument into the uterine canal or vagina. He had had no trouble from cystitis. Before the Alexander operation he curetted the uterus and put some gauze into the vagina, which was left in forty-eight hours after the Alexander. The urine was drawn two days, and subsequently after micturition the vagina was injected with 1 : 3000 corrosive sublimate.

As to results, he had been able to follow most of his cases, all having been operated upon since 1889, and in none had the uterus returned to its malposition. He thought so highly of the operation of shortening the round ligaments that, in his opinion, its conception entitled Alexander or some one to immortal fame.

Dr. Paul F. Mundé said he had performed Alexander's operation only forty-nine times, having heretofore been somewhat conservative in resorting to it, because he had felt that the knife should not be used where a pessary would answer the purpose. But his results had been so good that he had come to feel enthu-

siastic about shortening the round ligaments, and he expected to resort to it oftener in the future. He was the first to operate in America (1884). He thought adherent uterus and appendages constituted an absolute contra-indication. The only modification of this statement which he would make would be that if he found, on opening the abdomen in such a case, the appendages were sufficiently healthy to be preserved and the adhesions could be broken up, he would not now do ventral fixation, but open the inguinal canal and thus shorten the round ligaments. This would be better for the future interests of the patient than to ventrally fixate the uterus. In one of his cases the uterus had been prolapsed, and it returned. He looked upon prolapsus in second or third degree as a contra-indication. He operated as Dr. Johnson did, not like Dr. Edebohls. An assistant lifted the uterus with a sound. Formerly he used split bone drainage, but the last year or two discarded it. Suppuration was rare. He sealed the dressing with iodoform. A pessary was worn three to six months as a precaution. He had never found it necessary to go to the internal ring, except in a few instances in which the ligament broke. He often did other operations at the same time. He was told that five patients operated upon by him had become pregnant, but he had seen only one of them.

Dr. Buckmaster said that the Section was particularly fortunate in securing a paper from Dr. Kelly, who viewed the operation from the judicial position which the opportunities of the dead-house allowed him to assume. If the gynecologist can arouse the enthusiasm of the anatomist and can induce him to study his methods of work, then the specialty will be saved many errors.

In regard to the technique of the procedure, he was opposed to shaving the hair from the seat of operation in this as in other operations. He was also opposed to the use of ordinary soap; mollin or green soap should be used in its place.

Operators differed as to the indications for Alexander's operation, but there was a certain class of cases where all were agreed. A small, freely movable uterus, displaced backward and unaccompanied by disease of the appendages, was an indication recognized by all who urged the merits of the operation. These cases he could cure with the aid of pelvic massage and the use of a pessary, except there existed a complication, occurring frequently, although not usually recognized, where the bottom of the pouch of Douglas becomes adherent. The Alexander, like all other operations which hold the uterus forward, will drag on the rectum and perhaps on the neck of the bladder, giving rise to distressing symptoms. These objections are not theoretical, but the result of observation. The uterus is a freely movable organ, and anything which limits its movements can only be justified on the ground that a lesser evil is substituted for a greater. He would therefore restrict the use of the

Alexander operation to cases where the adhesions have been divided and it is necessary to keep the uterus forward in order to prevent their reformation, and he would only use it when it was evidently superior to other means of ventrofixation.

Dr. A. F. Currier said he was not one of those who believed that all cases of uterine displacement required operative treatment. He believed with Dr. Buckmaster that there were certain cases in which it was not yet time to abandon the use of the pessary. From his way of thinking, Dr. Mundé had given the indications for the Alexander correctly—retroflexion and retroversion without fixation, and prolapsus to a certain degree of an enlarged uterus. But where the uterus or its appendages were fixed the operation was not indicated; it was apt to do more harm than if one opened the belly so that he could see what he was doing. In one instance he could not find the ligaments, and in another a bad result was attributed to the use of catgut. In certain cases the method practised by Dr. Edebohls, first used, he believed, in Italy, was desirable; but it might not be necessary to slit up the canal its entire length, which would, perhaps, make hernia less liable to take place.

Dr. Jones had not seen a perfect Alexander operation until he had observed the work of Dr. Edebohls. A substantial round ligament could not be obtained until the internal ring was approached.

Dr. F. W. Grier thought that whenever the ligament could not be readily found one should proceed to slit up the canal.

Dr. H. N. Vineberg said he still held that any operation which fixed the uterus, which was naturally movable, was not ideal. While the operation under discussion might have its indications, he believed it would be found necessary in fewer cases if those practising it would try other methods faithfully.

The Chairman thought that, in some cases at least, it was best to slit up the canal, as practised by Dr. Edebohls. Indeed, he had found the operation so unsatisfactory that he had given it up until he had seen Dr. Edebohls operate.

Dr. Kelly then demonstrated the anatomy of the parts on the cadaver, and Dr. Johnson showed the manner of making the incision, lifting, and pulling upon the ligament.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of January 7th, 1893.

The President, J. Watt Black, M.D., *in the Chair*.

The following specimens were shown: Dr. Horrocks: (*a*) Long forceps, (*b*) Uterine sound, (*c*) Saline transfusion apparatus.

Dr. Rasch: Woman, subject of osteomalacia, cured by excision of the ovaries. Dr. Lewers: Papilloma on peritoneal aspect of ovarian cyst without other peritoneal injection. Dr. A. Routh: Deformed fetus. Dr. Boxall: Placenta previa of unusual size and shape.

A paper by Drs. Frederick J. McCann and William Aldren Turner was read

ON THE OCCURRENCE OF SUGAR IN THE URINE DURING THE PUERPERAL STATE.

The authors of this paper have investigated a series of one hundred cases, and from the results thus obtained have arrived at the following conclusions:

1. That sugar is present in the urine of women during lactation. (The authors assume with Hofmeister that this sugar is milk sugar.) Glucose may also be found.
2. That sugar is present at some period in every case.
3. That in the majority of cases the largest amount occurs on the fourth and fifth days of the puerperium.
4. That the quantity depends on (1) the condition of the breasts; (2) the quantity and quality of the milk; (3) the sucking of the child. Out of one hundred cases, the average quantity found was one and one-half grains per ounce.
5. That when lactation is diminished or suppressed the amount of sugar diminishes or disappears.
6. That when the production and exhaustion of the milk are equal the amount of sugar is very small.

Dr. A. Routh asked if the authors had been able to follow any of the cases so as to ascertain whether the glycosuria persisted; information on this point would be valuable as to the permanency of its persistence in these minor and primarily perhaps physiological cases.

Dr. Boxall mentioned the case of a suckling woman who was admitted to University College Hospital for repair of a ruptured perineum, and whose urine was loaded with sugar, so the operation was postponed for a week or two when the sugar had disappeared. When resident at the General Lying-in Hospital, his observations as regarded the presence of sugar in the urine of lying-in women completely coincided with the conclusions reached by the authors of the paper.

Dr. Horrocks pointed out that the paper was on a physiological and not a pathological subject. The cases were not diabetic, and in none of them, therefore, was there any reason for hesitating to perform any operation required. In true diabetes the fear of operation might induce coma, but otherwise he knew of no reason for not operating upon diabetic patients.

Dr. Wheaton agreed in the main with the authors' results,

but he did not think sugar was so frequently present as stated in the paper. Normal urine always contained a small amount of copper-reducing substances. In the cases where only 0.17 per cent of sugar was found by the authors he thought the reduction of the copper probably due to the excess of uric acid and urates generally present in the early part of the lactation period. The authors had not shown that the sugar present was really lactose, and asked if they had found any test to distinguish between it and dextrose or diabetic sugar. It seemed a most unusual thing that the secretion of a gland should be reabsorbed, and it would be important to ascertain whether the sugar existed in the blood during lactation. He had found that where a considerable amount of sugar existed in the urine of the mother it also was present in that of the infant, suggesting that the sugar was incapable of assimilation and of a more or less poisonous nature, and that its presence in excess might be injurious to the child. He thought the sugar in the urine of pregnant women might be due to congestion of the liver which was present, or to a ferment in the mother's blood producing a similar effect by the decomposition of glycogen.

Dr. Lewers asked whether, in addition to Fehling's test, that by potash and the specific gravity had been noted.

Dr. Griffith thought the probable explanation of the presence of sugar in urine of nursing women was that it is a resorption process from the mammary glands, varying in quantity with the activity of the secretion and the difficulty with which the breasts were emptied, and, as had been suggested, possibly with the composition of the milk.

In reply Dr. McCann thanked the Fellows for the reception given to the paper. The observations were made on one hundred cases, and over fourteen hundred samples of urine tested. The authors followed strictly the method of testing with Fehling's solution advocated by Sir W. Roberts—viz.: 1. Avoid prolonged boiling. 2. Allow suspected urine to stand twenty-four hours before deciding that it does not contain sugar. 3. Do not add excess of urine. Dr. McCann pointed out the importance of distinguishing between glycosuria and diabetes; glycosuria without constitutional symptoms is of little importance. Unfortunately the cases could not be traced, as lactation is stopped when the patients leave the hospital. The only method of distinguishing between glucose and lactose is by the polariscope, and where much sugar is present in the urine, probably accompanied by a large amount of lactose in the milk, the nutritive value of the milk is diminished. Various tests had been employed; the quantitative estimation was made with Pavy's solution. He pointed out the many important points still requiring elucidation, such as the composition of the milk, its nutritive value, and the condition of the blood during lactation.

Dr. Griffith communicated notes of a case of galactorrhea

occurring during a first pregnancy in a patient under the care of Dr. Fentern, of Bakewell. The excessive flow of milk (which reached a pint daily) continued during the whole period of gestation, and the treatment, which consisted in the administration of iron and quinine with pilocarpine, and in firmly bandaging the breasts, was apparently without material benefit.

ITEM.

The Belgian Gynecological and Obstetrical Society have decided to found an international annual competition bearing alternately on a gynecological or obstetrical question. Entries for the first competition will close September 1st, 1894. Manuscripts, written in French, must be sent before that date to the secretary-general of the society, M. Jacobs, 12 Rue des Petits-Carmes; must be marked by a motto or design, and be accompanied by a sealed envelope bearing a similar mark and enclosing the competitor's name and address. The prize will be the sum of three hundred francs. The subject of the competition for the coming year will be: "Chercher à établir par des expériences personnelles, anatomiques, physiologiques, chimiques, etc., le rôle rempli dans l'organisme par l'écoulement menstruel."

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ORIGINAL COMMUNICATIONS.

THREE CASES OF SYMPHYSIOTOMY, WITH ONE DEATH FROM SEPSIS.

BY

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IN September, 1892, L. J., a negro born in the State of Maryland, was admitted to the Maternity of the Woman's Hospital of Philadelphia. She stated that her mother was a cripple with a purulent discharge from one knee, and that her father died from some gastric trouble. From her personal history, which was very imperfect, it was impossible to ascertain the date of first dentition or the time of first walking, and her appearance was much older than that of 30 years, the age given. Her height was 142 centimetres, there was marked antero-posterior curvature of the tibiæ, and the lateral bend of the lower extremities gave the patient a waddling gait. The pelvic measurements showed a generally contracted, rachitic pelvis. The distance between the anterior superior spinous processes of the iliac bones was 23 centimetres, the greatest distance between the iliac crests was 24 centimetres, the conjugata externa 19 centi-

metres, and the conjugata vera 85 millimetres. She did not give a bad child-bearing history: six children were born living, and only one was lost in the birth, the last one, a breech presentation; one pregnancy terminated in an early miscarriage. The well-known fact that the degree of cranial ossification of the fetus increases and the compressibility of the head diminishes progressively with the age of the mother, should have great influence in the solution of all obstetrical problems. At the close of this ninth pregnancy the fetal head was found so firmly ossified that, with its narrow sutures and small fontanelles, great difficulty was anticipated in the delivery.

There were some pains as early as October 3d, but active labor did not begin until the 6th. The membranes ruptured early in the afternoon, and, although dilatation was almost complete, the head was still freely movable above the brim of the pelvis, and, notwithstanding the regular recurrence of pains, there was no attempt at engagement. At 11 A.M. on October 7th I decided to open the pubic symphysis, as the patient had been in labor twenty-four hours, with the membranes ruptured twenty-one hours, the pulse 120, the temperature 99°, the fetal pulse slowing, and the head still movable at the superior strait. The operation presented no special difficulty. After careful disinfection of the abdominal wall, the vulva, and the vaginal cavity, I made an incision, three centimetres in length, in the median line of the hypogastrium, and extended it to within one centimetre of the upper border of the symphysis. The pubic insertions of the recti muscles were partly cut, in order to allow the passage of a finger, by means of which I separated the prevesical connective tissue from the posterior surface of the articulation. During the operation the bladder and urethra were protected from injury by being depressed and pushed to one side by a catheter held in the bladder. Galbiati's falcetta was inserted between the finger and the symphysis, hooked around the lower border of the joint, and then drawn upward and outward, cutting from within outward and from below upward.

The pelvic bones were supported by pressure over the iliac crests. When the thighs were separated and flexed upon the abdomen there was a separation of three centimetres between the pubic bones, and during the extraction of the head this was increased to five centimetres. As there was no bleeding, the wound was packed with iodoform gauze, the catheter was

removed from the bladder, the forceps applied, and extraction of a living child easily and rapidly effected. The pubic separation remained at three centimetres until the thighs were extended and brought together, when the bones came into close apposition and were not held by any suture. A tear of the uterine orifice, which had occurred as a result of the high forceps operation, was repaired by catgut suture, and some vaginal rents and a perineal tear were united by silk stitches. The pubic wound was carefully cleansed and the edges brought together by deep and superficial stitches of silk, while fixation of the pelvis was secured by a roller bandage around the hips and by binding to each other the knees and the ankles. A self-retaining catheter was placed in the bladder, and the patient was put to bed and kept in a horizontal position on her back for four weeks.

I removed the pubic stitches at the end of a week, and found that the wound had healed perfectly; and later, when an examination could be made of the other lesions, I found their repair was satisfactory. When the patient was put to bed her pulse was 120 and her temperature was 99°. The rapidity of the heart's action continued for the first two or three days, after which the pulse came down to and remained below 100, until a sudden attack of gastritis on the twenty-fifth day sent it up to 124 and the temperature to 103°. After the subsidence of the stomach disturbance there were no further complications, and the pubic bones were firmly united at the end of three weeks.

The child, a girl, weighed 2,780 grammes at birth, measured 45 centimetres in length and 11 centimetres in width of shoulders, and had head diameters as follows: occipito-frontal, 12 centimetres; occipito-mental, 13½ centimetres; and biparietal, 9½ centimetres. The infant continued to thrive, and weighed at the end of a month 4,000 grammes.

The second case was a patient from the out-practice of the West Philadelphia Hospital for Women, Jennie J., a negro 25 years of age, with nothing in her early history of interest except the tardy establishment of menstruation at the age of 18 and the loss of mother and brother from consumption. This was the second pregnancy since her marriage three years ago. The first labor lasted four days, but terminated without assistance. The child is living, but rachitic to a marked extent.

The second labor came on at full term in the afternoon of

March 20th, 1893, and the membranes ruptured on the same day, before dilatation was complete and before the head had entered the pelvic cavity. The pains continued throughout the next day and night, and on the morning of the 22d two attempts were made to deliver with forceps; and, although much force was used in efforts at extraction, the head still remained fixed above the brim. The case was then reported to me, and I advised the removal of the patient to the hospital, where I saw her for the first time at noon of the 22d, fifty-one hours after the beginning of labor and forty-seven hours after the first discharge of amniotic liquid. With the exception of slight tibial curves, she was well built, tall, and well nourished. Her pelvis was generally contracted, measuring between the anterior superior iliac spines 24 centimetres, between the iliac crests 25 centimetres, and conjugata vera 82 millimetres. The pulse was 120 and the temperature was 102°. Much of the amniotic liquid having drained off, the uterine walls were closely applied to a large fetus which presented by the brow. As craniotomy was contra-indicated by the continued action of the fetal heart, and as there had been no report of discoloration of the liquor amnii, I decided to perform symphysiotomy, which I accomplished with considerable difficulty on account of the horizontal position of the symphysis. I used the knife devised by Dr. Harris, which, on account of its small curve, is better adapted for these operations than the falcetta of Galbiati. There was some hemorrhage from a varicose vein cut during the operation, but the bleeding was readily checked by pressure. The technique of the operation was the same as in the first case, with the exception of a pubic periosteal stitch of catgut. After opening the symphysis the forceps delivery was promptly accomplished, notwithstanding the persistence of the brow presentation. The child was born in the second degree of asphyxia, and, although the heart continued to act feebly for some time, all efforts at resuscitation were unsuccessful; its weight was 3,742 grammes, and the head measurements were: occipito-mental, 13¼ centimetres; occipito-frontal, 12¼ centimetres; and biparietal, 9½ centimetres.

The wound was closed by the ordinary deep and superficial stitches of silk; but it would have been better to insert a tube and secure free drainage, as was proved by the subsequent suppuration which continued for two weeks. The recovery was

slow; a left crural phlebitis developed in the second week, and some days later an arthritis of the right knee, so that the swollen leg and the stiff joint prevented the patient from walking before the eighth week, but the symphysis was firmly united in the fourth week.

The third case was Pauline H.. æt. 43, height 149 centimetres, married nineteen years, and pregnant twelve times. Her first seven labors were very long, and some were terminated by the use of instruments; but all the children were born living, although they died soon after birth. I saw her for the first time in her eighth labor and delivered her by craniotomy, as the child was dead and eighteen hours of strong and regular uterine contractions had not even succeeded in forcing the head into the superior strait. Her pelvis was generally contracted, with the following measurements: between the anterior superior iliac spines, 22 centimetres; between the iliac crests, 26 centimetres; and conjugata vera, 85 millimetres; and as she was very desirous of having a living child, I advised the induction of premature labor in another pregnancy. So in the eighth month of the ninth pregnancy she was admitted to the Woman's Hospital of Philadelphia, where, after repeated use of the vaginal douche and the internal administration of quinine sulphate, pains came on regularly. But the progress of the labor was very slow, the head remained at the brim, and I delivered her with much difficulty by a high forceps operation. The child was born living, weighed 3,250 grammes, measured in length 45 centimetres, and had the following head diameters: occipito-frontal, 12 centimetres; occipito-mental, 13 centimetres; and biparietal, 10 centimetres. The mother made a good recovery and left the hospital with her thriving child on the eighteenth day of the puerperium.

In the tenth pregnancy she came to the hospital about two weeks before full term, suffering from irregular uterine contractions, which were stimulated by the vaginal douche and warm sitz baths into active pains; but the head did not engage, so I applied Tarnier's axis-traction forceps and accomplished the delivery with very great difficulty. The child, a boy, born in the second degree of asphyxia, could not be resuscitated; his weight was 3,220 grammes, length 56 centimetres, and the head measurements were: occipito-frontal, 12½ centimetres; occipito-mental, 14 centimetres; and biparietal, 9½ centimetres. The

puerpera made a good recovery and went home on the eleventh day.

The eleventh pregnancy terminated in an abortion in the fifth month, and the patient was sent to the hospital after the expulsion of the fetus, with the statement that part of the after-birth had been left. I removed a large piece of placenta and washed out the uterine cavity. She recovered rapidly and was discharged on the eleventh day.

The twelfth and last pregnancy began the last of September, 1892, and in the eighth month she applied to the hospital for advice. I decided to try symphysiotomy, because the last induced labor had not been successful and the size of the pelvis would not sanction hysterotomy. I anticipated difficulty in cutting the symphysis, on account of the increased resistance from age and from inflammatory thickening the result of injuries from so many difficult labors. She gave her consent to the operation and was told to return at the first intimation of labor; but, for some reason, she failed to come at the time advised, and was not brought to the hospital until the third day of labor. Her pulse was then 128 and her temperature 98.4°, and, although the uterine contractions were very strong, the head had not entered the superior strait. The membrane ruptured shortly after admission, and, the fetal pulse being rapid, I quickly applied forceps and tried to extract; but failing to move the head, I resorted at once to symphysiotomy. All my fears about the condition of the symphysis were more than realized by the great difficulty of the operation. I tried both Galbiati's falcetta and the knife of Harris, and it was only after repeated efforts that I succeeded in opening the articulation. After obtaining a separation of 4 centimetres the delivery by forceps was not difficult. The child was born deeply asphyxiated and was only resuscitated by patient and long-continued efforts; his weight was about 3,000 grammes, length 55 centimetres, and head diameters: occipito-frontal, 11 centimetres; occipito-mental, 12 centimetres; biparietal, 9 centimetres.

There was very little bleeding from the pubic wound. The bones were brought into apposition and united by catgut sutures through the periosteum. The methods of closure of the wound and fixation of the pelvis were similar to those employed in the other two cases. The frequency of the pulse, which was 140 during the operation, continued in the lying-in, and the tem-

perature ranged from 101° to 103°. The restlessness of the patient was very great, so that it was impossible to keep her quiet even by the free use of anodynes. In the first few days there were some vomiting and diarrhea, but these symptoms were readily checked. On the fourth day there was a chill, and then the abdominal wound was examined. The union was good, but upon removing one of the stitches some sanious liquid was discovered around the silk. I then made an opening in the line of the wound, which I found communicated with a cavity containing the same kind of dark, bloody liquid, which I washed out and packed the wound with iodoform gauze. The cavity was kept thoroughly irrigated twice daily, but death occurred on the twelfth day with septic symptoms. The uterine involution was regular, the lochia were never offensive, and when an intra-uterine injection was given the uterus was found empty.

The consent to an autopsy could not be obtained, but the wound was freely opened and the cavity was found extending downward into the prevesical space and upward to a distance of two centimetres above the upper border of the symphysis. There was no communication with the abdominal cavity, bladder, or vagina, but the surrounding tissues were softened and blood infiltrated. The pubic bones were separated a space of one centimetre, and there was no trace of the catgut suture. The vaginal examination revealed nothing more than had been found during life. The case was clearly septic. The extreme restlessness caused the hemorrhage, and the patient, exhausted by a long labor, was too weak to resist infection.

My last case was somewhat similar to one reported by Pinard in the Baudelocque clinic, where, after symphysiotomy performed on the third day of labor, death occurred on the ninth day from septicemia, and at the autopsy the prevesical space was found filled with a clot undergoing putrefaction. Torngren's case ended fatally at the end of forty-eight hours after delivery; death was attributed to paralysis of the heart. The age of the patient was 40; it was a ninth pregnancy, and the pulse had been small and rapid during the operation. Gangrene of the genitalia, followed by death on the fifteenth day, was reported in Beugnies' patient, for whom at the end of the second day of labor various methods of delivery had been tried: first forceps, then craniotomy, and at last symphysiotomy. These

cases have been taken from Varnier's recent and very exhaustive article on symphysiotomy.

It is remarkable that in a patient of only 22 years Schwartz should have found the pubic cartilage so solid that he was unable to cut it with any knife and was obliged to use a saw. This case was also fatal; peritonitis developed, and death resulted on the eighth day. In all of the cases dying of sepsis it is important to note that at the time of operation there was great exhaustion from long labor.

Many important points were well brought out in the discussion on symphysiotomy in the March session of the Obstetrical and Gynecological Society of Vienna. Schauta called attention to the excessive strain upon the bladder, urethra, and other soft parts in the anterior part of the pelvis after symphysiotomy, especially during the extraction of the fetus, and advised slow delivery by downward pressure in order to protect the tissues deprived of their osseous support, suggesting manipulation similar to that employed for the preservation of the perineum, and recommending, in cases of great tension, bilateral episiotomy. Chrobak considered the liability of the wounds of the soft tissues to infection the greatest danger of the operation, and in order to avoid this risk suggested that one operator should make the pubic section and another operator should extract the child. The pelvic bandage was thought unnecessary by Herzfeld. who maintained that pressure sufficient to secure immobility of the hip bones would not be tolerated by the patient. Prof. Braun agreed with Koffer in the advantage of silver wire in uniting the periosteal surfaces of the separated pubic bones.

I have drawn the following conclusions from the study of my three symphysiotomies:

1. The importance of following the rule given by Caruso, limiting the operation to pelves with the conjugata vera between sixty-seven and eighty-one millimetres.

2. The advantage of an early operation, before the exhaustion of the mother and the danger to the child's life demand a rapid delivery. If symphysiotomy be performed early in the labor the patient may be allowed to deliver herself, thus avoiding the mutilation of the soft tissues from the sudden strain to which they must be subjected in any extraction, however slowly and carefully performed.

3. The necessity of thorough drainage of the wound.

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PELVIC PERITONITIS AND CELLULITIS.[1]

BY

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In an age when there is so much specialism we are apt to forget that pathological processes are the same in their essence in all tissues, modified only by the varying functions and the anatomical structure of each organ; that the course of inflammation is the same in whatever part of the body it occurs; and that the same essential surgical principles must guide the general surgeon and the gynecologist. The student is apt to feel, when he opens a book on gynecology, that he is entering on some absolutely new subject, and that what he has already learned in general pathology, and the principles he has been taught as lying at the root of all good surgery, will here fail him. And certainly, till very lately, text books seemed to foster such a feeling. Gynecological nomenclature is sufficiently perplexing, and, to the beginner at least, strikes confusion by its multiplicity of names; and worse than its names is its terrible etiology, of which so much is so mysterious and so intangible.

Later text books, however, notably those of Pozzi on general gynecology and of Bland Sutton on "Diseases of the Ovaries and Tubes," are doing much to lessen the mystery, to reject the doubtful and imaginary, and to substitute a fairly definite pathology, and treatment on ordinary surgical lines, for a morbid anatomy as trackless as the prairie, and treatment savoring of shotgun prescriptions and empiricism.

This change is part of that tide of progress that is affecting so perceptibly the whole domain of medicine. It is the outcome of an increasingly accurate physiology and pathology, and knowledge of what can and what cannot be done by drugs and by surgical agents. As our knowledge of the pathological course of a disease increases, as our methods of diagnosis become more accu-

[1] Read before the Texas State Medical Association, 1893.

rate and our estimate of what can and what cannot be done by each drug is more exact, we cease to pour all the drugs of the pharmacopeia into our patients on the principle that some one is sure to do him good, and, having defined as clearly as possible the result we wish to attain, use only that drug which will produce that specific effect. So in our schools the most advanced physicians give the simplest prescriptions.

And so, too, in gynecology, the immense knowledge gained in late years by the careful examination of pathological specimens removed in operation, and the invaluable lessons of the post-mortem room, are slowly putting what was till lately enveloped in mystery on a sound pathological basis. It has thus become possible with modern methods of diagnosis, and especially the skilful bimanual, to form a fairly good mental picture of what is the diseased condition and its probable progress, and thus to formulate definitely what one wishes to do in the matter of treatment. And here let us record a feeling of gratitude to those careful, painstaking workers who have not been content with performing brilliant operations, but have turned the search light of modern pathology on their specimens and have described and figured what they have found. Pathology is a modern branch of medical science, and the combined surgeon and pathologist a still more modern product; let us all remember that the microscope and post-mortem observations will throw more light than anything else on what we see by the bedside.

It has seemed to me that some time might not be unprofitably spent in drawing analogies between surgical pathological processes in the pelvic cellular tissue and in that of regions accessible to eye and touch, and in studying some lessons on pelvic peritonitis which the post-mortem room seems to teach.

Pelvic Cellulitis.—All sound pathological reasoning must depend on sound anatomy, so let us glance at the anatomy of the pelvic cellular tissue. The cellular area of the pelvis is shut off from the perineum by the pelvic fascia. This strong aponeurosis is attached to the pelvic wall between the pelvic bones and bodies of the ischia, along that thickening of the obturator fascia known as the white line. From this it passes as a continuous sheet over the levator ani and coccygeus to the vagina in front and rectum and coccyx behind. Behind the pubic symphysis it is closely blended with the vaginal orifice under the name of the triangular ligament. All inflammatory exudation

connected with the female genitals above the vulva takes place above this strong fascia; and as, in a septic wound of the palm of the hand, the exuded serum or lymph is forced to find accommodation on the back of the hand by the strong palmar fascia and the way in which the skin is bound to it, so the pelvic fascia forces the exuded fluids in septic wounds of the deeper genitals to find accommodation in the loose tissue above it about to be described.

The cellular area of the pelvis is limited above by the peritoneum, and it is this cellular tissue which makes it possible to strip the peritoneum so easily off the abdominal parietes. From the whole of the pelvis the peritoneum may be stripped readily, except along the middle line. The peritoneum cannot be readily stripped from the anterior surface and sides of the rectum, from the upper half or more of the vagina, from the whole posterior surface of the uterus, its fundus and anterior surface as low as the level of the internal os, and from the posterior surface of the bladder. Thus the cellular areas on the two sides of the pelvis are fairly well shut off from each other, except for a small tract of loose tissue between the cervix uteri and the bladder. The tissue between the bladder and pubes is partially shut off from the lateral cellular areas by the attachment of the pelvic fascia to the sides of the bladder. Water or air pumped into this cellular tissue separates the layers of the broad ligament, fills up that side of the pelvis, and may rise up into the iliac fossa; but has a special tendency to travel along the psoas muscle, along the round ligament to the inguinal region, and sometimes along the obliterated hypogastric artery and urachus to the umbilicus. It has little tendency to pass to the other side of the pelvis. Embedded in this cellular tissue, and especially between the layers of the broad ligament, is a most intricate network of arteries, with large companion veins from the uterus, ovaries, tubes, and vagina, and lymphatic vessels from the same organs; while lying in the cellular tissue at the side of the pelvis are the lymphatic glands which receive the lymphatics from the upper three-fourths of the vagina and cervix uteri, while the vulvar and lower vaginal lymphatics enter the inguinal glands, and those of the body of the uterus, tubes, and ovaries pass to the lumbar glands along the side of the psoas muscle and front of the quadratus lumborum. Keeping the anatomy of the parts in mind, let us draw a surgical analogy.

Think of the clinical course of a septic wound of the palm of the hand. The palmar tissues being closely bound together, exuded serum seeks the back of the hand, where there is plenty of loose cellular tissue exactly like that between the layers of the broad ligament and at the sides of the pelvis. The back of the hand swells, and, if the process continues, even coagulable lymph finds its way into its subcutaneous and intermuscular planes. The hand and fingers are quite hard to the touch, pitting only on firm pressure. Neglect the cause of the irritation and a diffuse abscess forms, burrowing in all directions and requiring many and free incisions, and all from a jag from a dirty nail, or a prick from a grouse bone, or any small septic focus. But remove the cause, get rid of the septic condition of the original wound, secure free drainage, and it is astonishing how soon the swelling disappears. And is not this exactly parallel with the clinical course of what we have long diagnosed as pelvic cellulitis? Let me draw a clinical picture such as any one in even a small gynecological practice must be very familiar with. You are called to see a patient with a distinct history of an abortion, or the history may be only that she has missed a week and then been rather profusely unwell (which in nine-tenths of cases means an abortion). A few days to a week afterward she has a rise of temperature, severe pelvic pain, especially in one iliac region, constipation, perhaps pain on micturition, and a more or less malodorous discharge. Bimanual examination reveals a large mass in the pelvis, the size of an orange or larger, pushing the uterus to one side and holding it fixed, bulging on one side of the rectum, seldom depressing the posterior fornix. If you are a young would-be gynecologist you feel very despairing about its going away, and expect it to suppurate. But under rest, hot antiseptic douches, and laxatives it all clears away in a marvellously short time, leaves your patient apparently as well as before, and there is no interruption in her child-bearing. Is it necessary to suppose that there was accompanying peritonitis, that it was anything more than a cellulitis? Laparatomists say they seldom see such cases when operating—and for a very good reason, because they seldom call for operation; and they are seldom met post mortem, because they do not end fatally. But they have been met with on both the operating and the post-mortem table.[1] Such cases have been diagnosed as uterine

[1] See Pozzi, "Traité de Gynécologie," éd. ii., p. 676. Lewers, Transactions

fibroids; electricity has been used, and the supposed fibroid has astonished the electrician by vanishing utterly in a few weeks, thus rivalling the results of Apostoli and Keith. Such masses are as hard and as round as fibroids, and are apparently continuous with the uterus, or separated from it only by a groove, and often the history alone will lead to a correct diagnosis.

If the condition be more aggravated coagulable lymph and leucocytes take the place of serum, and a certain amount of thickening and cicatricial contraction in one broad ligament, drawing the cervix uteri to the side in which the exudation took place, remains as the permanent result of the attack; and it is rare that one examines a multiparous woman without detecting some old trace of such a condition, especially in association with split cervix.

Etiology.—Our analogous case would at once suggest sepsis, and only sepsis; and clinical experience gives the same result. Such obscure causes as exposure to cold during menstruation should be regarded with the greatest suspicion. Thus abortion, childbirth, surgical procedures even the most simple, can account for most cases; and obscurer traumata, about which histories cannot be got, may be credited with the balance.

Treatment.—Again on general surgical principles the indications are, first, removal of the cause; second, absolute rest; and we know that, in our parallel case, if we incise and drain the palm wound the swelling on the dorsum will soon disappear. In our pelvic case the septic source is often not so easily defined; but at least an antiseptic vaginal douche should be routine treatment, and if there be any reason to suspect the uterus as the source of septic absorption, then an intra-uterine douche, and curetting if necessary, are among the indications.

And here I would emphatically insist that wherever any surgical measure, even the most simple, is undertaken on the genital tract, strict antisepsis is necessary as a means of prophylaxis, and that it would be better if abortions and labors were followed by the skilled use of the antiseptic vaginal douche and antiseptic diapers.

Next to antisepsis absolute rest is essential in all acute cases, and I regard proper attention to the bowels as an element in

of the Obstetrical Society of London, 1888, vol. xxx., p. 7. Carter, ibid. Delbet, "Des Suppurations pelviennes chez la Femme," Paris, 1891, p. 152.

that rest. The presence of scybala in the rectum is an undoubted source of irritation, serving to maintain pelvic congestion; and the routine use of salines, especially sulphate of magnesia, to the extent of producing one or two free, semi-liquid motions daily, is to be recommended, and acts probably partly as a derivative, partly by keeping the rectum free from hardened feces. In the progressive stage of the inflammatory process hot abdominal applications, with or without an irritant (I prefer turpentine stupes), or a fly blister, give distinct relief, acting as a counter-irritant acts in any deep inflammation; and, to promote absorption after the progressive stage has passed, hot douches, in the form of a gallon of water as hot as can be borne, twice daily, the patient being recumbent, are undoubtedly valuable. The question of intra-uterine interference must depend entirely on a careful estimate of whether or not it contains any removable source of septic absorption. If it contains septic matter, that undoubtedly ought to be removed. Usually the intra-uterine douche, the cervix being dilated if necessary, will be sufficient without the curette, unless there be any retained decidua.

Pelvic Abscess.—While later text books draw attention to the pelvic lymphatic vessels and glands, I think far too little prominence is given to the rôle they play in pelvic suppuration. Of course we cannot palpate a large and tender gland in the para-uterine space, and for this reason we are very apt to forget its presence. But what is more common than to have a gland in the groin or axilla suppurating as the result of a neglected septic wound of foot or hand, and is it to be expected that the pelvic glands will always escape in vaginal or cervical wounds? Are those who would describe every pelvic abscess as of peritonitic or tubal origin not neglecting altogether the presence of these glands and the usual course of pathological processes in septic conditions?

As the result of the palmar wound we were first considering, diffuse suppuration of the cellular tissue all over the hand, or a glandular abscess in the axilla, may supervene; and would it not be surprising if, as a result of a cervical tear plus sepsis, suppuration of the cellular tissue of the pelvis or a glandular abscess did not occasionally occur? Suppose, then, that such an abscess is formed, where would the anatomy of the parts teach us to look for its pointing? Into the rectum, vagina, or bladder is possible, and cases of each are comparatively common; it may

travel along the round ligament to the inguinal canal and point above Poupart's ligament; along the obliterated hypogastric and point at the umbilicus; or through the great sacro-sciatic foramen and point on the buttock. I have private notes of cases opening respectively through the vagina, above Poupart, at the umbilicus, and in the gluteal region.

The treatment of suppuration must be again on general principles. Whenever you have distinct evidence of pus, get at it and give it free exit. Free incision and drainage is the indication as soon as you can be sure of your diagnosis. The aspirator may guide you in finding the pus, and guide your scalpel in incising. Make the opening where it points, if where antisepsis can be carried out. But there can be no indication for opening the abdomen to drain an abscess which can be drained by the vagina.

Before passing to pelvic peritonitis I ought to mention that the constant galvanic current appears to hasten the absorption of pelvic cellulitic exudation.

Pelvic Peritonitis.—During two years in Edinburgh I removed the pelvic organs in every post-mortem examination in the Royal Infirmary on a female body at which I was present, and though press of other duties prevented my working up the large collection of valuable material thus acquired, yet the general examination of these specimens supported the conclusions I would draw from these specimens I have here to show you. And here let me say that I do not propose to deal with such causes of pelvic peritonitis as pyosalpinx, ovarian and paroöphoritic tumors, and tubal pregnancy (under which class I would include at least most cases of pelvic hematoma or hematocele), but rather with those milder cases of pelvic peritonitis which one meets with so commonly in the post-mortem or consulting room, and which are not so clearly demonstrable as due to a definite cause.

Case 1 is the pelvic organs of a patient who died during sexual maturity. The anterior surface of the uterus and broad ligaments shows nothing pathological, but the posterior surface is occupied by extensive peritonitic adhesions. These are concentrated round each ovary and tube; and though the tubes are both patulous, yet they are so bound down, and their relations to the ovaries so altered, that pregnancy would seem impossible. The adhesions to the rectum are less marked than at either side,

but are such as to produce a retroversion of the uterus, which might be corrected, but it would be difficult to maintain the true position.

The second specimen is from a subject, about 35 years of age, who died of cancer of the pancreas. There is a small patch of cervical catarrh (cervical adenoma of Bland Sutton). The anterior surface of the uterus and broad ligaments is healthy but for one or two small spots of secondary peritoneal deposit of cancer; but their posterior surface shows evidence of old peritonitis, and the tubes, ovaries, and rectum are so bound together by old adhesions that the utero-rectal pouch of peritoneum is entirely obliterated. The uterus is not retroverted, but is drawn back as a whole, maintaining an axis in relation to the pelvis such as the normal uterus would occupy when the bladder is full. There is no distention or apparent thickening of the tubes, but they are so twisted and so bound to the ovaries as to be undoubtedly functionless. Again, though the adhesions occupy the whole recto-uterine pouch, they seem more concentrated round the ovaries and tubes.

In the third case, from a negress over 50 years of age with a syphilitic history, there are no adhesions, except of the tubes to the ovaries; but both tubes are so adherent to their ovaries that their abdominal ostia cannot be discovered, and sterility must have resulted. This specimen is specially interesting because the vermiform appendix has been caught in the inflammatory process and is bound down to the right tube, thus reminding one that, in operating upon tubes or ovaries on the right side, one might readily mistake the appendix for a thick band and tear or cut it without ligature, with serious results.

Case 4 is from a nulliparous woman with an infravaginal cervix hypertrophied till it is two and a half inches long. The body of the uterus presents several intramural fibroids, the largest of which is rather larger than a walnut. There are one or two peritonitic bands joining the body of the uterus to the bladder. Both tubes are tortuous, thickened, and bound to their ovaries so as completely to obscure them. The omentum is adherent to the right tube; the posterior surface of uterus and tubes is adherent to the rectum. Again the adhesions are most concentrated round the tubes and ovaries.

From these specimens, and from extended post-mortem experience, I feel warranted in drawing the following conclusions:

First, *that pelvic peritonitis is usually, perhaps always, due to the spread of septic or infective matter from the tubes.* The adhesions are always concentrated round the abdominal ostia of the tubes, and practically always on the posterior surface of the broad ligaments. If the irritant spread, as it is often stated to do, by the lymphatics or lymph spaces through the uterine wall, or from a previous cellulitis between the layers of the broad ligament, there is no reason why peritonitis should not be as frequent on the anterior as on the posterior surface of the uterus and ligaments; yet it is nearly always confined to the recto-uterine pouch. There is usually associated with peritonitic adhesions some evidence of there having been a salpingitis.

The many ways in which the tubes may be infected certainly suggest that the salpingitis had existed before and probably caused the peritonitis. It is much easier to account for the almost constant involvement of both sides by supposing the condition due to a double salpingitis secondary to some uterine infection.

One of the specimens shows the tubes to be both pervious, and their mucous membrane under the microscope is apparently healthy; but here I would suggest a pathological analogy. In gonorrheal epididymitis in the male we have two distinct types of clinical history. In one the inflammatory process can be traced along the vas deferens to the epididymis, pain and thickening being first felt in the cord and then travelling downward; and this seems analogous to a tubal inflammation followed by a peri-ovaritis. In the other type the epididymis is inflamed without any evidence whatever of inflammation of the vas; yet undoubtedly infection spreads to the epididymis by the vas deferens, there being no other route possible.

Now, may it not be that in some cases of gonorrheal peritonitis the uterus and tubes, though acting as the channel by which infective germs have spread, yet themselves have reacted little to their presence? All mucous membranes are not equally vulnerable by the gonococcus, and, further, the same mucous membrane is not at all times equally sensitive. In gonorrhea in the male the bladder, prostate, and vesiculæ seminales are seldom invaded; the vas deferens may escape even in cases where the epididymis is involved; the conjunctiva is peculiarly liable to infection, the nasal mucous membrane seldom or never. And again, if the urine be mild and kept so, the inflammation of the

urethra will be slight and will usually run a mild course; but concentrated, irritating urine will at once convert a slight mucopurulent discharge into an abundant purulent one.

So in the female it is the urethra that suffers most; vesical catarrh even then, in spite of the shortness and wideness of the urethra, is infrequent; but infection of Bartholin's glands is comparatively common. I am strongly inclined to think, from an extended experience in the female venereal wards in Edinburgh while house surgeon there, that gonorrheal uterine and tubal infections are after all not so very common when one considers the enormous number of prostitutes that pass through one's hands without any clinical evidence of either. Tubal abscess is rare. In six months' experience in wards containing about forty beds, I saw only one case where we had reason to suspect pyosalpinx; and while I think mild, semi-chronic attacks of peritonitis (the well-known prostitutes' colic) are common, yet suppurative peritonitis, though possible and always to be guarded against, occurs in a very small percentage of the actual cases of gonorrhea. I would urge, therefore, that though in post-mortem examination of cases of pelvic peritonitis we may find occasionally no evidence of disease of the tubal mucosa, yet there is no reason to suppose that the tubes have not been the vehicles of infection.

Only one of our specimens shows evidence of peritonitis on the anterior surface of the broad ligaments, and in it there are uterine fibroids; and we know that the continued pressure of a foreign body will set up adhesive peritonitis without the presence of septic matter. Thus, if the uterus be stitched to the anterior abdominal wall with a silk suture, though the peritoneum be not opened for the purpose, and all antiseptic precaution be taken, it will adhere to it; and I have no doubt that in this case the fibroids, acting as foreign bodies, caused the adhesions.

Secondly, these specimens seem further to suggest the conclusion that *pelvic peritonitis will usually result in sterility;* and this would furnish another argument in favor of the existence of pelvic cellulitis without accompanying peritonitis. We all have experience of cases of pelvic inflammation followed by subsequent pregnancies. The sterility of prostitutes is generally believed to be due to peritonitis.

Thirdly, the frequency of old pelvic adhesions discovered post

mortem shows that such cases *tend to run a mild course* and do not, as a rule, endanger life; while the dense adhesions round such a sensitive organ as the ovary, and the necessary obstruction to the Fallopian tubes, amply explain the recurring pelvic pain so common and so distressing in patients who have had a peritonitic attack. Obstruction to a mucous canal is always associated with great pain. Take, for example, the severe pain associated with an obstructed bile duct or vermiform appendix.

Etiology.—Besides, then, tuberculous and cancerous cases, dermoid cysts, tubal pregnancy and pyosalpinx, and innocent tumors causing adhesive peritonitis by pressure, I would narrow down the etiology of pelvic peritonitis to:

1. Traumata, including the escape of fluids used surgically into the peritoneum.

2. The spread of septic or infective matter by way of the Fallopian tubes.

Para-uterine cellulitis may coexist, but is not the cause of peritonitis; rather they both proceed from the same infected condition of the genital tract.

Exposure to cold or indiscretions during menstruation, and simple shock, are causes which rest on no definite pathological data, and, while helping us occasionally in a convenient way out of a difficulty, should be regarded with extreme suspicion as being very improbable causes of pelvic inflammation.

It might be well here to call attention to what cannot be too often insisted upon. For a long time, two years at least, after a man has had an acute attack of gonorrhea, indiscretions in diet or indulgence in alcohol may render his urine irritating and induce a slight discharge, and this discharge, being infective, may be communicated to the female and be the starting point of chronic pelvic peritonitis. Thus the convivialities of the marriage feast and the sexual excitement of connubial relations may bring back a discharge in the bridegroom which soon confines the bride to her couch and dooms her to a life of invalidism and sterility, and their female friends say, "Poor Mrs. So-and-So has been so delicate since her marriage."

With regard to treatment our specimens and conclusions as to etiology suggest:

1. The tendency, in all but those acute cases which pass quickly into general peritonitis, being *toward cure* (but for the resulting adhesions), the first indication, and paramount above

all others, is absolute rest, the bowels being kept open by mild salines, and pain relieved by hot fomentations or turpentine stupes. Opium and antipyretics, as tending to cloak the symptoms, should not be given where they can be avoided.

2. As it is impossible by intra-uterine treatment to reach infected tubes, and all attempts at treatment of the uterine mucosa will so disturb the parts as to increase the local inflammation, nothing further than a mild antiseptic vaginal douche should be used, unless there be some very definite septic condition of the uterus to be got rid of. Curetting will usually do harm instead of good.

3. Old adhesions matting together ovaries and tubes, and giving rise to pelvic pain, cannot be affected by medicinal remedies, other than those which keep the bowels slightly loose and improve the general health.

4. Means tending to affect the local circulation may favor partial absorption of inflammatory material and lessen passive congestion. Thus hot vaginal douches, glycerin tampons, and iodine applied to the vaginal roof may be beneficial.

5. The natural condition of the uterus, tubes, and ovaries is one where free movement is permitted. They should lie forward close to the bladder, so that an air cushion, formed by the air-containing coils of ileum, may separate them from the rectum and its solid fecal contents; and where uterus and appendages are bound down by adhesions and pelvic pain results, then, when all acute symptoms have entirely disappeared, pelvic massage may aid in stretching tight peritonitic bands and promoting mobility of the fixed parts, just as massage is indicated in the treatment of a joint stiff from the adhesions that result from a sprain or synovitis.

THREE CASES OF MYELOMA (SARCOMA) OF THE FALLOPIAN TUBE.

BY

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(With eight illustrations.)

In 1890 Prof. H. F. Formad (a coroner's physician of Philadelphia) presented me with thirty-five specimens of tubal

tumors, all of which, as he supposed, were cases of tubal pregnancy, and had been removed by him post mortem from women who had died suddenly. These were selected specimens of tubal tumors from the autopsies of over three thousand adult women. On examination some of the specimens were found to be decomposed to such a degree that they could not be utilized for microscopical research. The others I carefully preserved and mounted, in order to study the morbid changes taking place in the walls of the Fallopian tube in consequence of tubal pregnancy. Three of the cases, out of those available for careful microscopical study, much to my surprise have proven to be malignant tumors of the tube wall, and not tubal pregnancies as diagnosed at the post-mortem examination. Since all the specimens were obtained from women who had died suddenly, and during whose life no diagnosis had been established, it is reasonable to presume in each instance that large intraperitoneal hemorrhage was the cause of death in all the cases of tubal pregnancy, as also in those cases in which the malignant Fallopian tumors were found.

The truth of this assumption is established by the facts revealed upon a careful microscopical examination of the three specimens of malignant tumors. A clot of blood was found attached to the ruptured portion of the tube wall, and with the microscope partial hemorrhagic infarction could be seen in the tissues of the tumors.

In 1890 Prof. Formad published in the fifteenth volume of the Transactions of the Pathological Society of Philadelphia a report of these thirty-five cases, with a photo-illustration of one case, entitled "Hematocele of tube, result of ectopic pregnancy," which he surmised to be a tubal pregnancy. I am inclined to believe, from the gross anatomical aspect of the tumor, that this is an illustration representing one of the malignant sarcomata under consideration. There is, however, no possibility of ascertaining definitely the facts in regard to this supposition, but the macroscopical appearance therein presented suggests this hypothesis.

To explain the cause of the fatal hemorrhage it is only necessary to take into consideration the following facts.

It is highly probable that with the advancing growth of these tumors the large blood vessels located near the peritoneal covering of the tubes have been encroached upon and their walls

transformed into the myeloid tissue of which the several tumors are composed. They have, therefore, become dilated or have been rendered brittle and more liable to rupture. After a time they could no longer resist the intravascular pressure and have given way, thus causing a fatal intraperitoneal hemorrhage. After a careful examination and study of these tumors with the microscope, I am justified in announcing them to be sarcomata of three different types. According to Virchow's nomenclature, one of the tumors would be termed a large "round-celled" sarcoma; the second, a large "spindle-celled" sarcoma combined with "net-celled" sarcoma; and the third, a "melanotic or pigmented" sarcoma.

Virchow was the first pathologist to attach a definite meaning to the term sarcoma, and this definition is now generally recognized and adopted by his followers. He differentiated the various forms of sarcoma from each other and from carcinoma, and proved them to be connective-tissue formations, in contradistinction to cancer, which is an epithelial formation. He included under sarcomata all those new formations which consist of some modification of embryonal connective tissue. The term sarcoma, as applied to these tumors, is unquestionably a misnomer, since in its literal translation it signifies a fleshy tumor. The term myeloma, which was first suggested by an American author to designate tumors of this type, should be universally adopted, and the term sarcoma dropped from pathological terminology. While it is true that the term myeloma has been utilized by pathologists generally to designate that form of sarcomatous tumor originating in the medullary cavity or the cancellous tissue of the long bones, yet it would be a simple broadening of its signification to include under the head all the different varieties of sarcoma, which, pathologically considered, are really composed of connective tissue in an embryonal or medullary condition. I wish, therefore, to emphasize the statement that the name myeloma, or medullary tumor, is in this writing used synonymously with sarcoma.

All neoplasms of the Fallopian tube are extremely rare; therefore it is not surprising that up to the present time only one or at most two cases of undoubted tubal myeloma have been reported.

Dr. J. E. Janvrin[1] described a case of "myxo-sarcoma of the

[1] Annals of Gynecology, vol. ii., No. 8, 1889.

tube," and concerning the literature of the subject makes the following statement:

"Coe[1] says, 'There is no authentic case of sarcoma of the Fallopian tube on record.' He further says, 'Sänger reports a case of so-called primary sarcoma of the tubes,[2] which he (Sänger) affirms is the only one on record.' Coe doubts the correctness of the diagnosis." Janvrin concludes his article with the following words: "The report of the examination of the specimen made by Dr. Wm. H. Porter, pathologist to the Post-Graduate School of Medicine, after going into a very careful and detailed description, concludes as follows: 'The general histological construction of this newly developed tissue would argue against its being classed as an inflammatory growth, but would place it among the mixed connective-tissue growths. Owing to the large variety of histological elements found, it is impossible to give it any single name which will in any adequate manner express the condition. It may well be classed under one of two headings: either as a composite fibro-sarcoma or as a composite myxo-sarcoma, the latter being the more accurate of the two.'"

Case I. *Globo-myeloma* (large round-celled sarcoma).—The tumor replacing the constituent elements of the tubal tissue is composed of protoplasmic bodies, the majority of which are of a prevailingly large size. These bodies contain large nuclei and are coarsely granular. We see scattered among them granules and lumps of matter of a high refracting power, but lacking in definite structure. These latter lumps may be looked upon as the outgrowth of the living matter, from which will be developed subsequently the above-described nucleated elements. The protoplasmic bodies in many places, as shown in the section, are densely crowded, and at these points are very nearly of a uniform size. I have selected for illustration a portion of the section where are shown the large nucleated bodies distributed in an irregular manner throughout a field of indifferent protoplasm; and the different stages of the process of development from the living matter into the granular lumps, and ultimately the nucleated granular bodies or myeloma corpuscles, can here be discerned by a diligent study of the specimen (see Fig. 1).

[1] "American System of Gynecology," vol. ii., p. 894.

[2] Centralblat für Gynäkologie, xxxvii., 1886.

The portion of the specimen shown in the figure is also available for settling another important question—viz., what is the extent of the vascular supply of the tumor? The tumor, during the life of the patient, was but scantily provided with blood vessels, and these were mainly of the capillary type. The newly formed capillaries attract our notice by their unusual size and wide calibres, bounded at the sides by large and irregular endo-

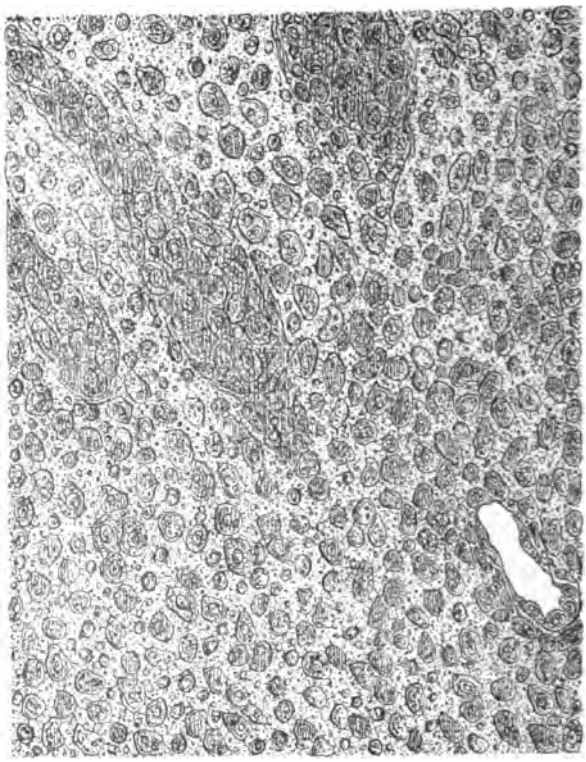


FIG. 1.—Globo-myeloma of Fallopian tube. × 600. M, M, myeloma corpuscles of varying sizes, coarsely granular or homogeneous, embedded in a finely granular protoplasm; C, newly formed capillary blood vessel, lined by large and irregular endothelia; O, previous blood vessels obliterated and transformed into myeloma tissues.

thelia. Many tracts, composed of densely packed myeloid corpuscles traversing the tumor in different directions, can be seen, and are undoubtedly the remnants of previous blood vessels which have become obliterated and transformed into solid tracts of embryonal tissue. This assertion is based upon the fact that there may still be seen tracts containing vestiges of the walls of

capillary vessels, exhibiting an outgrowth of the bordering endothelia, undergoing a transformation into myeloma corpuscles. Owing to its scanty vascular supply this tumor belongs to the variety of sarcoma termed by older authors encephaloid from its brain-like appearance. Considerable interest attaches to the changes which are taking place in the bundles of smooth muscle fibres which traverse the tumor in longitudinal and trans-

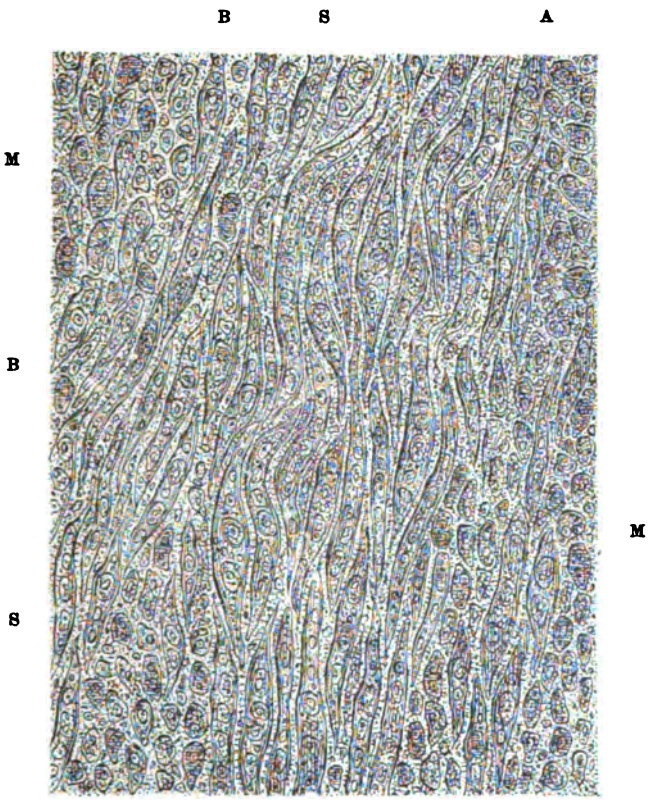


FIG. 2.—Transformation of smooth muscle tissue into myeloma tissue. × 600. S, S, spindles of smooth muscle fibres in a beginning proliferation; A, A, advanced proliferation, shown by the appearance of coarsely granular lumps within the spindles; B, B, breaking-up of spindles into myeloma corpuscles; M, M, accomplished formation of myelomatous tissue.

verse directions. These obviously are the remnants of the muscle bundles found in the tube wall (see Fig. 2).

Here we are able to trace the gradual change of the original muscle spindles into myeloma corpuscles. We observe, first, that the spindle becomes coarsely granular, and there appear

within its interior solid or coarsely granular lumps of protoplasm. Accompanying this change there is a simultaneous enormous increase in the size of the spindles. Next, the lumps in the spindles are enlarged and arranged in chains or rows in the interior of the spindles, without the occurrence of a noticeable change in the shape of the spindle itself. At a more advanced stage the spindles break up into chains or rows of dis-

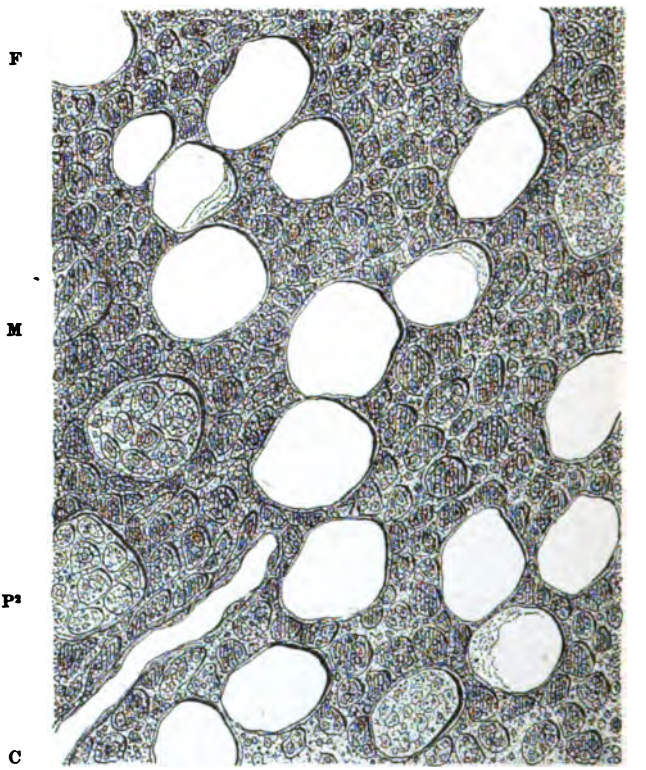


FIG. 8.—Transformation of fat tissue into myeloma tissue. × 600. F, F, fat globules, from which the fatty matter has been extracted by ether in the process of embedding in celloidin; P¹, beginning transformation of fat into protoplasm; P², advanced transformation of fat into protoplasm; M, M, elements of globo-myeloma; C, capillary blood vessel.

tinct protoplasmic bodies, many of which still remain conical, thus indicating that they took their origin from previous muscle spindles. As the final step of the transformation we see that large, well-formed, nucleated, protoplasmic bodies have made their appearance, such as we may consider to be typical ele-

ments of a myeloid tumor. Throughout all the phases of their development the union of the tissue elements is established by means of delicate conical threads which traverse the narrow cement substance between the enlarged spindles, or connect the lumps or pieces of protoplasm which have originated by a splitting-up of the muscle spindles, and these same conical threads serve to interconnect the completely formed myeloma corpuscles.

Another feature of considerable biological interest which is to be observed in another section is the change of the tumor which is taking place at the periphery of the tube, where, in the normal condition, there is more or less subperitoneal fat tissue present (see Fig. 3). In the section under observation (see Fig. 3), at certain points the site of former globules is easily recognizable as large, empty, and more or less globular spaces, from which, in many instances, the fatty matter has been extracted (by the preparatory treatment of the specimen with ether) in the process of hardening and embedding in celloidin for cutting the section. The capsule of these fat globules is, in many parts of the specimen, still recognizable, although the nuclei of the corpuscles themselves are everywhere transformed into myeloma corpuscles. Many of the fat globules, however, have not been emptied, but are now filled with well-formed protoplasmic bodies, representing the various stages of development of the myeloma tissue from fat globules. The appearance here presented indicates with great exactness that the protoplasmic bodies have developed *in situ* by a direct transformation of the living matter of the myxomatous fatty tissue.

Returning to the examination of our section, we notice first, in one portion of the specimen, that the fatty capsule is filled with protoplasmic masses finely granular in character and but very faintly stained with the carmine coloring matter. At a more advanced stage globular bodies begin to appear in the interior of the protoplasmic masses, many of which are supplied with nuclei. Each one of these bodies may develop into a distinct myeloma element. When the ultimate stage of its development is reached, the indistinct capsule is the only remaining vestige to indicate the previous existence of a fat globule. I wish to lay particular stress upon this mode of transformation of the fat globules into myeloma corpuscles, for quite recently German writers have noted similar changes occurring in the fat

globules during the progress of inflammation. It is more especially P. Grawitz, of Greifswald, and his pupils who claim a direct transformation of the fat globules into a number of protoplasmic bodies, termed by them "slumbering cells." Grawitz can hardly claim priority for this observation, for the same change was observed and recorded by an American writer more than ten years ago.

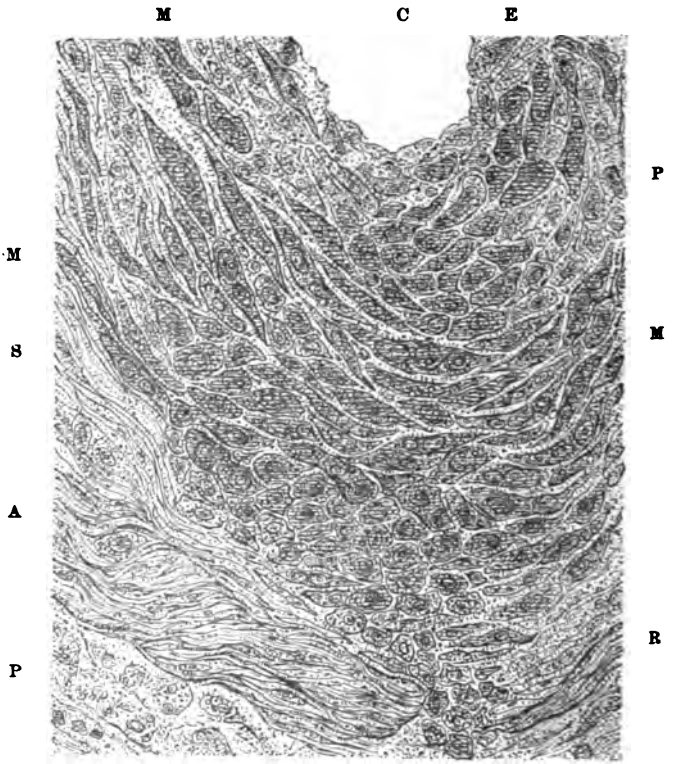


FIG. 4.—Transformation of wall of artery into myeloma. × 600. C, calibre of artery; E, endothelia transformed into a protoplasmic layer; M, M, smooth muscle fibres in transformation into myeloma corpuscles; P, P, protoplasmic layers with irregularly scattered nuclei; S, spindles sprung from adventitia; A, adventitia unchanged; R, remnants of adventitia.

In order to understand and explain the cause of the fatal hemorrhage occurring during the rapid growth of the myeloma, it occurred to me that it would be necessary to observe and trace the changes effected in the walls of the blood vessels, more especially the arteries, by the progress and development of the myeloid tumor. (Such changes are illustrated in Fig. 4.)

In this specimen it will be observed that the site of a previously existing artery may still be recognized by the space corresponding to its calibre, bordered by endothelia and the elements of the artery wall, which are now much changed from their normal appearance. The most pronounced alterations which I have observed are to be seen in the middle or muscle coat of the artery. The changes are the same as those which have been above described as occurring in the smooth muscle fibres of the tubal wall. The spindles become enlarged, coarsely granular, rows of protoplasmic lumps appear within the spindles, and they ultimately break up into at first conical and afterward globular, nucleated elements, and these undoubtedly belong to the type of myeloid elements which constitutes the main mass of the tumor. Portions of the adventitia or connective-tissue coat have escaped the general transformation into myeloma, though the greater bulk of the artery wall is involved and has been transformed by such changes. It is easy to comprehend that by the transformation of the constituent elements of an artery into myeloma its wall is rendered brittle and unfit to resist the intravascular pressure. At a given moment the pressure of the blood, to which the arterial wall is still subjected, becomes too great and it gives way. I do not hesitate to attribute fatal hemorrhages in sarcoma of the tube to the degenerate changes just described as occurring in the walls of larger arteries.

Case II. *Spindle Myeloma* (large spindle-celled sarcoma of Virchow).—The tumor consists mainly of spindles, both in longitudinal and transverse sections. Portions of the tumor appear to be composed of single spindles, or small bundles of spindles united in a reticular arrangement. The tumor, therefore, is a combination of Virchow's "large-celled sarcoma" and "net-celled sarcoma." According to the new nomenclature its title, therefore, would be spindle myeloma combined with spindled net myeloma. In looking at a section with low powers of the microscope we recognize spindles of varying sizes, either so closely packed together that only a narrow interstice exists between the spindles, or we see groups of spindles separated from one another by somewhat broader fields of indifferent protoplasm; in the centre of these fields are grouped clusters of protoplasmic bodies, which are well shown in Fig. 5.

In this figure there is also represented a transition stage

from the simple spindle myeloma into the spindle net myeloma. This transition is brought about by an inosculation or anastomosis of the spindles at their pointed ends. In this way a comparatively coarse-meshed network of spindles is formed. Filling in the rhomboidal-shaped meshes of the network we see a goodly amount of indifferent protoplasm, with here and there interspersed clusters of protoplasmic bodies. The type of the

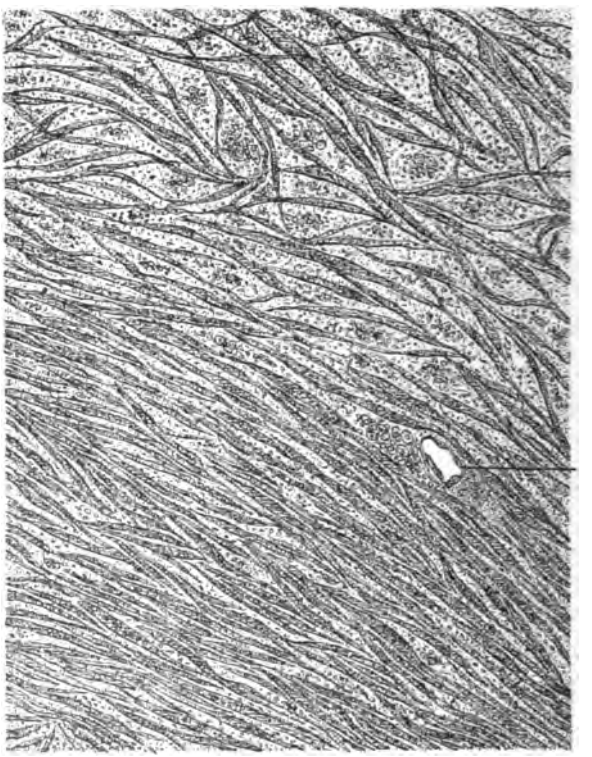


FIG. 5.—Spindle- and myxo-myeloma of the tube. × 200. S, S, spindle myeloma; M, M, myxo-myeloma; C, capillary blood vessel.

spindles and their peculiar arrangement throughout the tumor exclude the possibility of their being mistaken for smooth muscle fibres of the tube wall. Neither is there a possibility of falling into the error of not differentiating the appearance here presented from an interstitial inflammatory process so frequently found in the tube wall. The difference between muscle spindles and the spindles building up our myeloma is best illustrated with higher powers of the microscope (see Fig. 6).

In the first place, we observe that the spindles exhibit a great variety in their length and breadth, that they follow a pretty straight course, with a parallel arrangement of the individual spindles of each separate bundle. On the other hand, the arrangement of normal muscle spindles is quite different. In the first place, they are of a small though pretty uniform size and freely interlacing with one another.

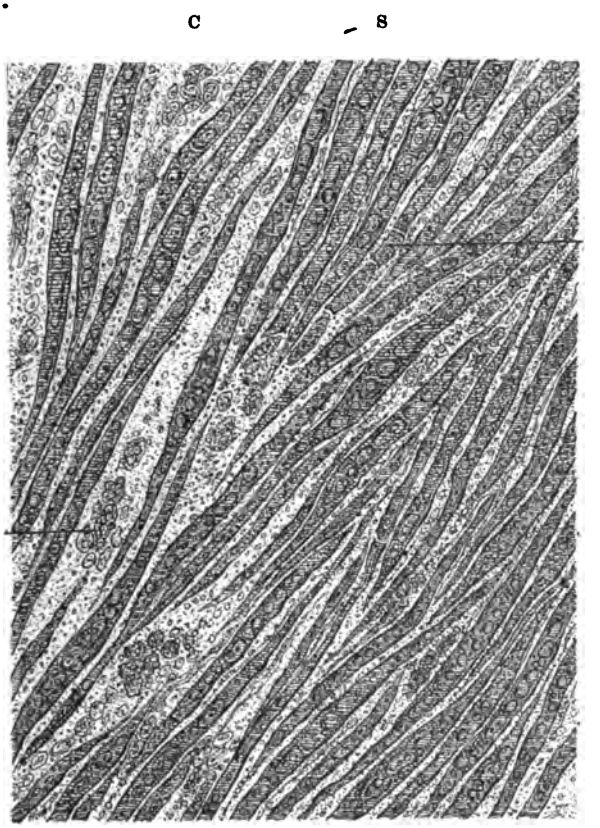


FIG. 6.—Spindle myeloma of the tube. × 600. S, S, granulated and vacuoled spindles; M, spindle broken up into medullary corpuscles; B, B, faintly granulated basis substance; C, C, coarsely granular protoplasmic clusters in basis substance.

Next, we notice that the fields of finely granular protoplasm between the groups of spindles are quite conspicuous; this feature is never so marked in the muscular tissue of a normal tube wall. The infiltration of the spaces between the spindles with basis substance gives rise to the fine granular appearance of the protoplasm in these fields. Another conspicuous feature

to which we wish to draw particular attention is that the meshes formed by the reticulated spindles are interspersed with groups of protoplasmic bodies varying greatly in size. It is more than possible that these groups indicate a medullary pre-stage of future spindles. The interior structure of the spindles is, in many instances, characterized by the presence of rows of granules and globules, although in many spindles no such structure could be distinctly made out. In the section under observation, at the points of transition of the type from spindle myeloma to that of spindle net myeloma, we observe that there is an increase in the number of the coarsely granular protoplasmic bodies grouped about the centre of the fields of basis substance. In a tumor of this character the occurrence of a proportionately large amount of basis substance is considered an indication of lessened malignancy of the myeloma. But in our case, since there are so many clusters of protoplasmic bodies occupying the fields of basis substance, we are led to the conclusion that this law of lessened malignancy does not hold good. In some places, indeed, their number is so great that one might very naturally be led to think that we are dealing with a combination of spindle- with globo-myeloma. Such a combination is generally admitted to be rather common in myeloma tumors. The vascular supply of this tumor was scanty, as has already been shown in the previous case.

CASE III. *Melanotic Myeloma* (melanotic sarcoma of Virchow).—It is much to be regretted that nothing was known in regard to the clinical history of the case from which this specimen was obtained. Malignant melanotic tumors usually occur as primary formations in the skin, and subsequently lead to the formation of secondary tumors in the internal viscera.

These secondary formations may occur as colorless or pigmented tumors. The organs of predilection for the appearance of secondary myeloma nodules are those in which the vascular supply consists of the richest and most closely woven capillary network—viz., the liver, the lungs, the kidneys, etc. The formation of primary melanotic nodules in the internal organs is an extremely rare occurrence. Even in the female breast but few primary melanotic tumors have been observed (Billroth). If in our case the melanotic myeloma should have been a primary formation of the tube, the case would certainly be a unique one. Even though the possibility of its being a second-

ary formation cannot be denied, yet the finding of a melanotic tumor in the Fallopian tube is indeed an occurrence of the greatest pathological interest. The clots of blood present were so extensive that only comparatively small portions of the tumor were left intact and fit for microscopic analysis. In the examination of the specimen with low powers of the mi-

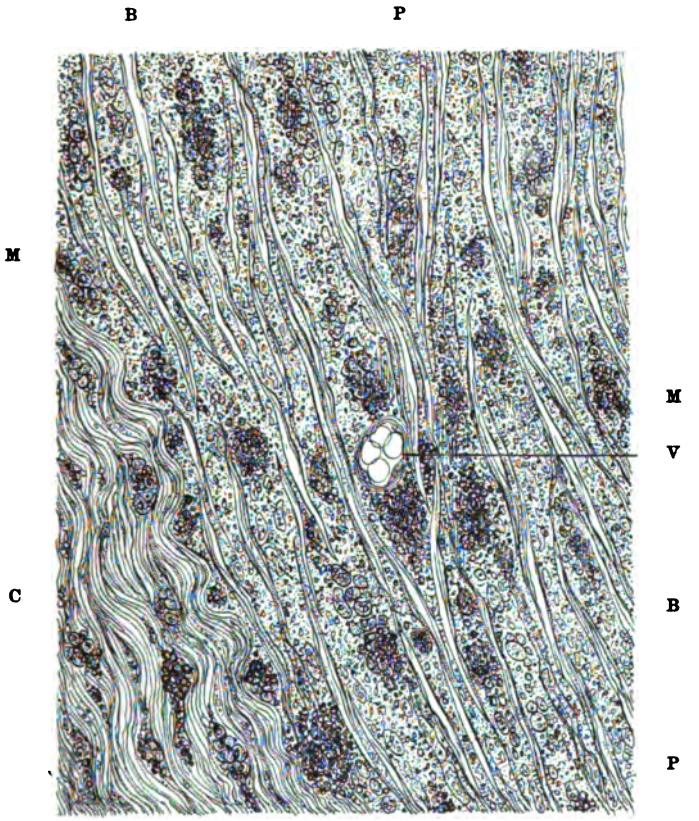


FIG. 7.—Melanotic myeloma of tube. × 600. C, capsule of dense fibrous connective tissue, with melanotic clusters between the bundles; M, M, melanotic clusters; P, P, non-pigmented protoplasm; B, B, bundles of fibrous connective tissue; V, capillary blood vessel in transverse section.

croscope, the feature most conspicuous to the eye of the observer was the deep brown pigmentation throughout the tissue. I have selected for microscopical analysis a place where the tumor seems to have been enclosed by a broad capsule of fibrous connective tissue, possibly the outgrowth of the peritoneal covering of the tube (see Fig. 7). In the capsule we notice clus-

ters of protoplasmic bodies, most of which are colored to a deep-brown hue. Only the smallest spindle-shaped protoplasmic bodies between the bundles of fibrous connective tissue escape this pigmentation. We can trace the gradual development of the pigmentation from the non-pigmented interstitial protoplasm, through various gradations, to the pigmented clusters of the darkest hue. Toward the central portions of the tumor it should be noticed that there are bundles of fibrous connective tissue which have been pushed apart, as it were, by large masses of intervening protoplasm, in which again clusters of pigmented bodies are stored up. It is apparent, after a careful examination of the specimen, that the development of the myeloma in this case has resulted from a transformation of the normal tissues in a manner common to all myeloma tumors. In the first place, the basis substance of connective tissue—or, in the case of the section under observation, the densely fibrous connective tissue—has become dissolved or liquefied. As the natural outcome of this liquefaction we have the reappearance of indifferent protoplasm which has replaced the previous basis substance. In this indifferent protoplasm new elements, mostly of the type of globo-myeloma, have developed. Coincident with the development of these newly formed lumps they have been supplied from some source with a diffused dark pigment, thus changing the type of the tumor from that of a simple globo-myeloma to a melanotic myeloma.

The next question of importance which we are called upon to answer is, what has been the origin of the pigment coloring of the myeloma elements? The theory that has been advanced by previous writers—viz., that the pigment is derived from extravasated blood—is untenable, since many instances of melanotic myeloma are on record in which there was no trace to be found of extravasated blood; and, furthermore, the vascular supply of the tumors was so scanty that it seemed very improbable to suppose that the pigmentation could have originated in this way. Still, it must be admitted that it is undoubtedly the coloring matter of the blood, either as hemoglobin alone or as a combination of the iron salts of the blood with sulphur, that produces the pigment. Everywhere in the pigmented clusters we notice a number of globular bodies, of a yellowish color, which are wholly destitute of structure and which do not reach the size of fully developed blood corpuscles. Such globules have been known to pathologists since the year 1876 as the

"hematoblasts of Heyem." These bodies are merely lumps of living matter saturated with hematoglobin. We are therefore forced to the conclusion that it is the hematoblasts which produce the black pigment granules, and, by their accumulation, form the coarsely granular clusters of diffusely pigmented protoplasm seen in the melanotic myeloma now under observation. In fact, all the pigmented clusters appear, upon close microsco-

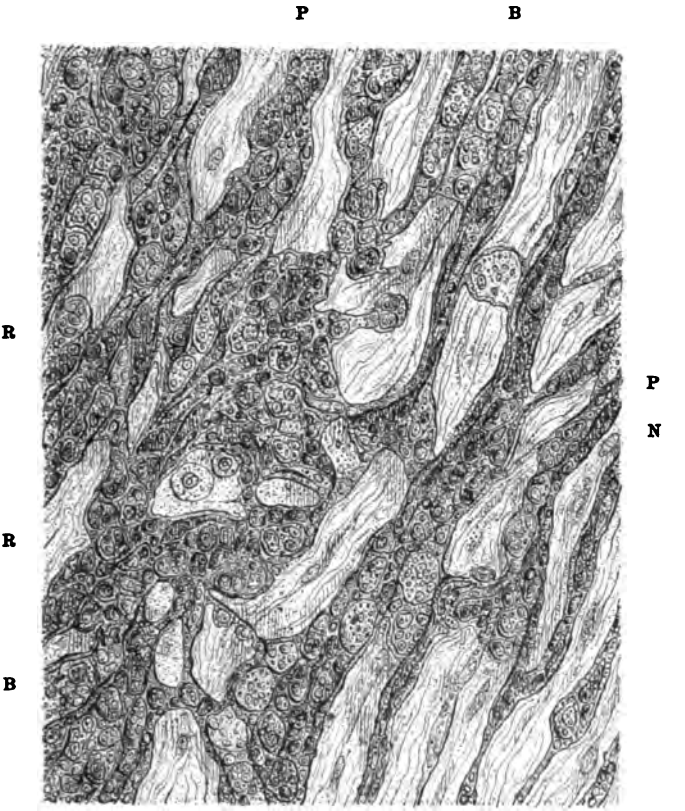


FIG. 8.—Melanotic myeloma of tube. Transformation of fibrous connective tissue into myeloma. ×600. P, P, protoplasmic bodies, slightly pigmented; B, B, bundles of fibrous connective tissue partly changed to protoplasm; R, R, remnants of bundles; W, faint nuclei in the bundle.

pic analysis, to be made up of hematoblasts, partly unchanged, and partly transformed to pigment granules. We must therefore adopt the view that in all melanotic tumors the coloring matter is not carried into the tumor from without, but is altogether autochthonous, which means that it has originated within the elements of the tumor itself. Further proof that the changes

just described have taken place in the melanotic myeloma under observation is furnished by the study of other portions of the tumors (see Fig. 8).

Here we see remnants of the bundles of fibrous connective tissue which had become only partially transformed into myeloma. That these partially formed myeloma elements owe their origin to the protoplasm derived from the liquefaction of the basis substance is plainly demonstrated at the points where the bay-like excavation penetrates, to varying depths, into the fibrous connective-tissue bundles. Again we notice that the protoplasm replacing the basis substance is at first always colorless. The pigment granules and pigment clusters appear in the centre of the excavated portions at a somewhat later period. Their appearance is evidently due to a more rapid outgrowth of the living matter and its increased supply with hemoglobin under the influence of an augmented oxidation.

VITELLINE-DUCT REMAINS AT THE NAVEL.[1]

BY

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(With four illustrations.)

In November, 1892, a boy, 15 years old, was brought to me by his father because the navel, which he stated had never healed, had become a source of discomfort to his son, especially when walking. It was learned that there had been something wrong with the navel since birth, and the blame for this was placed on the midwife, who was supposed to have made some mistake in cutting the cord. There had been no special inconvenience felt until very recently, when it was noticed that the navel became tender and sore, particularly after walking or running; a little matter had also appeared, staining the clothes. It was noticed that the boy walked carefully, bending his body forward. The previous history was otherwise negative, and the father had no knowledge of any such or similar conditions in any of the other members of the family. Physical examination

[1] Read before the Gynecological Society of Chicago, April 21st, 1893.

showed a well-developed boy, in good general health, whose body was free from all blemish except at the umbilicus, which presented the following appearance:

Projecting from its lower third is a pedunculated, polypoid outgrowth (Fig. 1), 2.5 centimetres in length and 3 centimetres at its widest circumference near the rounded, free end. This mass is of a uniform deep-red color, its surface delicately smooth and velvety, covered with grayish, mucoid shreds. The narrow peduncle is apparently attached to the fibrous structures in the floor of the umbilical depression, as the volume cannot be diminished the slightest by pressure toward the abdominal cavity. In other words, this red mass is not reducible. There is no opening found upon the surface, nor depression that might suggest the previous existence of any orifice or canal. The line of

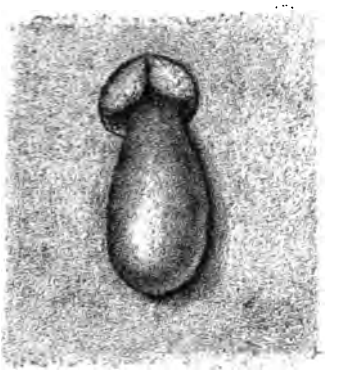


FIG. 1.—Showing polypoid umbilical outgrowth.

junction of the skin with the covering of the peduncle at the bottom of the umbilicus is even and abrupt. The pedicle crowds upward the folds of the integument covering the navel, and it is somewhat compressed as it escapes from the grasp between these folds and the circumference of the umbilicus below, upon which are small but exceedingly sensitive ulcers. The mass itself is not sensitive to the touch, but it bleeds readily, bright-red blood oozing out when handled a little roughly.

A diagnosis of a so-called adenoma or diverticular prolapse at the umbilicus was made, a ligature was placed around the pedicle near its attachment, and the polypoid outgrowth was cut away with scissors. No hemorrhage followed. In a week the ligature fell off, and in a few weeks afterward the little red spot left was completely cicatrized.

Immediately after its removal the mass was divided into numerous suitable pieces, fixed in Flemming's solution, washed in water, dehydrated in alcohol, embedded in paraffin, and microtomized. The sections thus obtained were stained in various fluids, and the microscopical appearances may be summarily described as follows: There are two principal layers to be taken into account—a peripheral or glandular zone, and an internal central mass consisting of smooth muscular fibres and connective tissue. The surface is lined or covered with tall, symmetrically nucleated, columnar cells without any demonstrable cilia, placed upon an unbroken, quite homogeneous basement membrane. Projecting from this surface are villous, club-

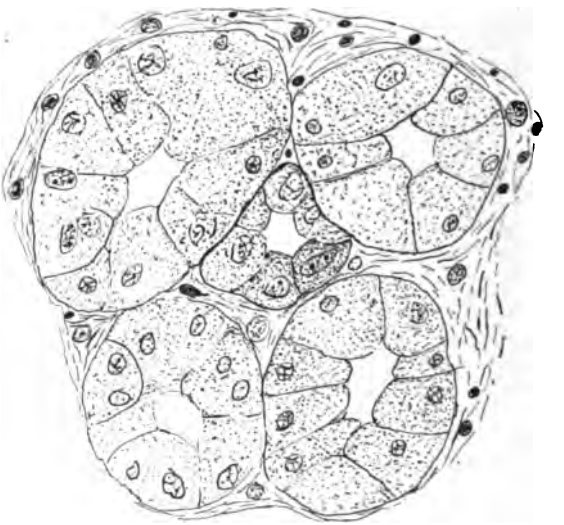


FIG. 2.—Cross-section of tubules in glandular layer. Camera-lucida drawing. × 320.

shaped masses consisting of loosely meshed connective tissue, in which are many nuclei and small blood vessels. Between these rather short, club-shaped villi are the openings of the gland tubules which compose the glandular zone of the outgrowth. The tubules are lined with more or less cuboidal epithelial cells, disposed in a single layer, with a tendency to assume the appearance of cylindrical cells as the free surface is approached. The tubules terminate in blind extremities which are buried in the intertubular connective tissue deep down in the mass; their lumina are empty; the cells present distinct outlines, a granular protoplasm, and deeply stained nuclei. In many of the cells, both of those lining the tubules and the free surface, are

seen typical karyokinetic figures in the sections prepared for the purpose of bringing them into prominence (Fig. 4). In Fig. 2 is presented a portion of the deeper strata of the glandular zone with the tubules in transverse section. In Fig. 3 is a portion of the periphery, with a villous projection which has been cut in a direction somewhat oblique with reference to the main or longitudinal axis of the outgrowth, and this fact will explain the presence in its centre of hollow spaces lined with tall, columnar cells. The intertubular tissue contains quite a number of blood vessels of medium size, the majority containing blood; there

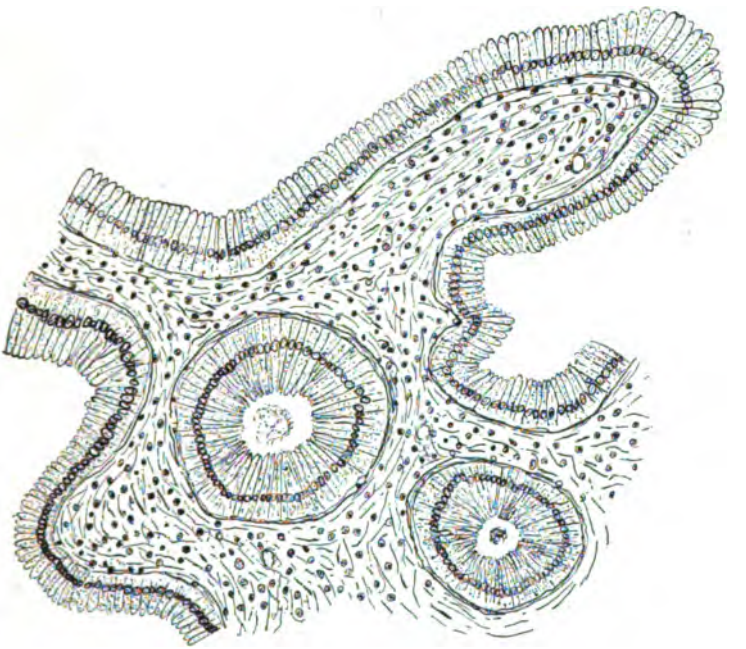


FIG. 3.—Oblique section through villous projection from surface. Camera-lucida drawing. × 320.

are also a few foci of round-cell infiltration here and there, suggesting some inflammatory process.

Internally, to the blind extremities of the tubules and the accompanying intertubular connective tissue is a zone of smooth muscular tissue whose arrangement cannot be said to follow any definite plan, and in the very centre of the whole mass is a quantity of rather firm, fibrillated connective tissue. No lymphatic-gland structure was found in any part of the sections examined.

The microscopical structure of the outgrowth consequently corresponds very closely with the structure of the mucous membrane of the small intestine, with its Lieberkühn's follicles or glandular tubules, the villous projections from the surface, and the characteristic cylindrical-celled lining of its exterior. The structure of the central part of the mass also reproduces the smooth muscular and the connective tissue found in the wall of the small intestine, although the arrangement of these tissues is not typical of that in the intestine. It is therefore plain that the polypoid umbilical outgrowth described is an instance of the so-called diverticular prolapse at the navel, which is somewhat unusual from the fact that, although congenital, it was first brought under observation fifteen years after birth.

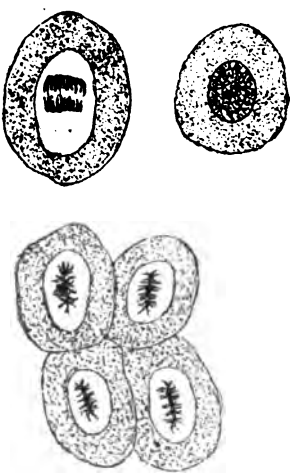


FIG. 4.—Karyokinetic figures in cells lining the glandular tubules. Seitz obj. one-twelfth oil immersion, eyepiece 5, tube length 160 mm., camera lucida. Section stained with gentian violet.

The congenital umbilical outgrowths whose structure reproduces more or less perfectly some part of the gastro-intestinal canal, and of which the specimen just described is a typical example, are now generally regarded as connected with persistent omphalo-mesenteric structures. Küstner[2,3] was the first to distinguish by means of a microscopic examination between the granulation cell outgrowth and the adenoma, as he called the glandular masses, although Kolaczek[1] had already traced the origin of this adenoma of Küstner[2,3] to the partial or complete prolapse of the wall of the persistent abdominal segment of the

[1] The small figures refer to bibliography at end of the article.

vitelline duct, and he gave the structure the name of entero-teratoma. Küstner subsequently accepted this theory of Kolaczek [1,4] as the probable mode of origin, but at the same time he called attention to the possibility that the masses might also be due to inclusions at the navel of portions of the digestive tract from that period of embryonal development when part of the alimentary canal is temporarily extruded into the umbilical cord. The temporary umbilical hernia thus produced occurs, according to Minot,[5] only in man, and it can be observed in embryos at the second month. The production of the hernia is ascribed to traction produced by the yolk sac through its stalk. Following Küstner and Kolaczek, all subsequent observers, almost without an exception, attribute the congenital glandular masses as due to malformations or inclusions on the part of the omphalo-mesenteric duct. Ziegler [6] says that adenoid masses may grow from duct remnants in the navel, and Orth [7] traces the small outgrowths covered with mucous membrane to a partial or complete prolapse of the wall at the outer diverticular opening, while Klebs speaks of them as combination tumors that may come either from dislocated parts of the digestive tract or from vitelline-duct remnants. Lannelongue and Frémont [8] revert to the possibility of some of these growths originating from navel inclusions of parts of intestinal loops in the umbilical hernia, strangulation not occurring; but they favor the view that the structures come from the diverticulum formed by remnants of the vitello-intestinal duct. Tillmanns [9] assumes, in order to explain the origin of an umbilical outgrowth covered with pyloric mucous membrane, that early in embryonal life a piece of the stomach was included in the navel; this and similar cases will be further discussed a little later on. William Anderson [10] describes a congenital umbilical fistula with non-development of the sigmoid flexure and rectum, post-mortem examination of which showed a prolapse of the ileum one and one-quarter inches above the cecum, the gut being firmly attached to the umbilical aperture; and he concludes that there had existed a sort of umbilical Littré's hernia, persistent from the early fetal condition referred to, and that part of this hernia had been cut off in the removal of the cord, because the fistula developed on the second day after birth. He does not mention anything about the possibility of a Meckel's diverticulum protruding into the cord, the distal cut end of which was not examined. Roth [11] concludes an instructive article on malformations con-

nected with the omphalo-mesenteric duct about as follows: There may be found (1) the common Meckel's diverticulum free in the abdominal cavity, in a hernial sac, or, very rarely, intra-mesenteric; (2) the diverticulum may be adherent by means of its blind extremity, or by means of a fibrous cord formed by the obliterated remnants of the omphalo-mesenteric vessels, to the navel, or, less frequently, to some other part of the abdominal wall; (3) the diverticulum is patent, the condition being one of umbilical fistula, and the external opening at the umbilicus may be surmounted by a partial or complete prolapse of the diverticular wall, and this condition may also become complicated by a secondary intestinal prolapse through the open diverticulum; (4) the diverticulum forms the starting point of retention cysts, entero-cystoma, which may or may not remain in connection with the intestine, and whose location may vary considerably.

The importance of persistent intra-abdominal omphalo-mesenteric remains in the causation of intestinal duplication, cyst formation, and obstruction is clearly elaborated in the classical essay of Fitz;[11] and it is among the conditions referred to more especially under the third class of omphalo-mesenteric malformations, as tabulated by Roth,[10] that an explanation is to be found of the origin of the majority of congenital glandular enlargements at the umbilicus. These enlargements may assume various shapes. Most numerous are the polypoid and pedunculated congenital masses, whose covering is an exact reproduction of the normal mucous membrane of some part of the small intestine or the stomach. The interior consists of smooth muscular fibres and connective tissue, often arranged in such a way that the production of the mass might be thought to result from the eversion and prolapse through the umbilical opening of a small area of some part of the alimentary canal, the serous surfaces subsequently becoming firmly adherent to each other. Such polypoid masses are in the majority of instances solid, without any passages or canals, and their connection with more or less perfect intra-abdominal omphalo-mesenteric structure is as yet unknown, because there is no record of any observations upon this point either after death or during a laparatomy. It is assumed by many writers that these fleshy tumors, or mucous umbilical polypi, as some call them, originate from the partial or lateral eversion and prolapse at the navel of the wall of an open Meckel's diverticulum; that the serous surfaces of the prolapsed portion unite, while the opening into the canal of the

diverticulum becomes obliterated, so that a post-mortem examination ought to show a diverticulum adherent to the umbilicus. In other cases the navel outgrowth has one, or even two, openings upon its external surface, which may lead into canals that may terminate blindly or may empty into the lumen of some part of the intestine. Externally the masses with fistulous passages are covered with a mucous lining similar to that found on the solid tumors, but this mucous membrane is also found to line the fistulous canals. In one instance Roth [10] was able to make an examination after death of a six-months-old child that presented during life a bright-red polypoid mass, two centimetres long, at the navel. Through an opening upon the summit a probe could be passed for some centimetres. Particles of food also came out of this opening occasionally. The specimen showed, as described and figured by Roth,[10] a patent diverticulum, fifty-six centimetres above the ileo-cecal valve, which opened at the umbilicus; and through this opening a circular prolapse of the diverticular wall had ensued, producing the external polypoid mass with its central canal, the lining and covering being characteristic intestinal mucous membrane. Roth [10] assumes that in the separation of the funis the blind and attached end of the diverticulum was opened. Holt [12] refers to several cases in the literature, a number of which were collected by Barth,[11] of umbilical outgrowths with openings and canals; in some of these cases there were two fistulous canals, and Holt [12] shows by a number of instructive diagrams the various modes and degrees of eversion and prolapse of the diverticular wall and of the intestine through the patent diverticulum, that explain very satisfactorily the origin of these curious malformations, the fundamental condition in all of which is a persistent and patent diverticulum adherent to the navel. The instance of unique congenital malformation described and illustrated by Gibb[14] is undoubtedly, as pointed out by Holt,[12] an example of a patent diverticulum in an umbilical hernia complicated with prolapse and eversion. Chandelux [15] describes a projection at the navel, six centimetres long, covered externally with mucous membrane, showing a short, blind canal, and he believes that this was a totally prolapsed and almost completely everted diverticulum whose connection with the intestine was interrupted.

In connection with this it is also of interest to note that entero-

cystoma may occur at the navel or in the abdominal wall in its immediate vicinity; these cysts, the structure of the wall of which is identical with that of the intestine, are believed by Fitz,[14] Roth,[15] and other writers to originate from unobliterated vitelline-duct inclusions in the abdominal parietes. Zumwinkel[16] describes such a cyst about the navel in a child 7 years old, and similar instances are detailed by Roser[17] and Wyss.[18]

As long as entero-cystomata have been found in the abdominal wall without any connection with the intestine, it is also quite plain that all of the solid polypoid navel outgrowths need not necessarily be connected with any persistent intra-abdominal omphalo-mesenteric remains; they might develop from inclusions in the navel, just as the entero-cystoma is believed to do. On the other hand, many of the enlargements with fistulous passages undoubtedly develop, as shown by Roth's[19] observation, from the eversion and prolapse of the wall of a patent diverticulum opening at the navel; and there is no reason why many of the masses without any canals should not be due to partial or lateral prolapse of the diverticular wall, and it would seem reasonable to state that post-mortem examination some time in the future will show that some of the solid masses are connected with abdominal remnants, while others are not.

That all polypoid, red masses congenitally present at the umbilicus are not necessarily due to vitelline-duct remains is intimated by the case of fleshy navel tumor with patent urachus described by French[20] in a girl 6 weeks old, who presented a red umbilical protrusion through a small opening, on which there issued urine; there was no microscopic examination to show positively whether this was an instance of eversion and prolapse connected with a patent urachus or not. At this time it is also necessary to speak particularly of the cases of umbilical outgrowths described by Tillmanns,[9] Heukelom,[20] Ball,[21] and many more, in which the growths were covered with a mucous membrane identical with that of the pyloric end of the stomach, and which were styled by Tillmanns[9] ectopia ventriculi and ascribed to inclusions at the navel from the time of the temporary umbilical hernia referred to. Heukelom,[20] however, found in a free intra-abdominal diverticulum in a new-born child, arising a moderate distance above the ileo-cecal valve, an area the mucous membrane of which corresponded exactly to that of the pylorus in the same individual; and he came to the

conclusion, after further extended observations, that originally the whole intestinal tract is clothed with similar epithelium, which is differentiated later in embryonal life, and he consequently explains Tillmanns'[9] ectopia ventriculi as due to navel inclusions of areas from diverticula lined with mucous membrane identical with the pyloric mucosa of full-term children. At the same time it must not be forgotten that many instances are recorded of diverticula arising from the upper portions of the small intestine. Meckel, cited by Fitz,[11] states that Lobstein and Wrisberg observed a vitelline duct connected with the duodenum; Major described a diverticulum arising from the jejunum and provided for some distance with valvulæ conniventes; and, according to Fitz,[11] some authors refer the origin of some of the esophageal diverticula to the insertion of the duct into the upper part of the alimentary canal, and thus it might be that the umbilical outgrowths with pyloric structure were due to inclusions from the vitelline ducts of uncommonly high insertion. At any rate, there is no positive evidence of any kind to decide the question raised as to the exact origin of navel tumors covered with pyloric structure, but the explanations indicated might hold good.

The congenital structures here discussed have been variously named. Küstner[3] called them adenomata; Kolaczek,[1] entero-teratoma; Lannelongue and Frémont,[6] adenoid diverticular tumors. In the English literature[20-28] they are commonly referred to as congenital umbilical polypi, but the terms fleshy tumors,[19] mucous polypi, and warty tumors have also been used; Miller[20] divides congenital polypi into those with branched and those with unbranched tubules; Holt[13] very properly objects to the terms adenoma and entero-teratoma as inappropriate and incorrect, and he entitles his case an instance of umbilical tumor due to prolapse of the intestinal mucous membrane of a Meckel's diverticulum; and Pernice,[21] in his recent monograph on umbilical tumors, in which he also considers thirty-eight cases from the literature and one personal case of this so-called adenoma, disapproves of this word and of the term entero-teratoma, and proposes the name diverticular prolapse at the umbilicus as descriptive and explanatory of the nature and origin of the swelling; while Vellar[22-24] introduces the term gastro-teratoma, or gastric adenoma, in order to distinguish between those growths covered with intestinal mucosa—the entero-teratoma or intestinal

adenoma—and those covered with pyloric mucosa. Inasmuch as the only fact in regard to the origin of these growths in any way demonstrated is their quite undoubted connection with omphalo-mesenteric remains at the navel, while the condition of affairs in the abdominal cavity when they occur is practically unknown, it would seem that such terms as diverticular prolapse really presuppose more than is actually and definitely known. A short and appropriate name is difficult, if not impossible, to invent, and consequently the phrase polypoid vitelline-duct remains at the navel, or some modification thereof, appears exact and descriptive enough at the present time.

Such vitelline-duct remnants at the navel cannot be so very infrequent, as shown by the number of cases described in the literature during the last few years since attention has been directed to them. They are congenital; appear, on the separation of the cord, implanted on the umbilical cicatrix; they may be small and nodular or polypoid and pedunculated; usually less than one centimetre in length, but occasionally much longer; their surface is smooth, velvety, and uniformly deep red in color, being often aptly compared in this respect with the color of the rectal mucous membrane; there is, as a rule, no orifice to be found on the surface, but instances are described of growths with shallow depressions, blind passages, and complete fistulous canals leading into the intestine. The solid growths, which are here especially considered, are irreducible, do not diminish in volume on compression, and there is no gurgling and no tympanites on percussion; the mucous covering secretes a viscid fluid, which in Tillmanns'[8] instance was acid in reaction and contained pepsin, showing the functional as well as the histological similarity between the lining and the gastric mucosa. The patients remain in good health, and there have not been noticed any unusual abdominal symptoms in these cases. The structures grow almost imperceptibly, and it does not seem that in any case has the increase in size been out of proportion to the general growth of the individual. In the case here described it was thought that the polypoid remnant was a little larger when the boy was 15 years old than it was at birth. Vitelline-duct remnants can be positively distinguished from the umbilical granuloma, capillary angioma, and from possible allantoic remains by means of the microscopic examination only. They are to be removed by thorough surgical measures, care

being taken in the preliminary examination to establish with absolute certainty the absence or presence of any fistulous passages, which, if present, might materially change the *modus operandi*, should the removal of the growth then be decided upon. The removal should be thorough, in order to prevent any possibility of any form of carcinoma originating from the epithelial cells of the inclusion, according to the familiar misplaced embryonal matrix theory of Cohnheim. Pernice[28] showed, in his thorough study of carcinoma of the umbilicus, that in a number of primary tumors the structure corresponded with that in intestinal carcinoma, and he surmises that such tumors might originate from omphalo-mesenteric remains. Lastly, it may be allowed to call attention to the lesson conveyed by Anderson's case,[29] to leave a long stump when dividing the cord, as a precautionary measure against the possible division of prolapsed abdominal contents in the interior of the cord, whose presence might not be suspected from the external examination of the child.

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CHRONIC OÖPHORITIS AND ITS TREATMENT BY ELECTRICITY:[1]

A CLINICAL STUDY.

BY

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B. Exciting Causes acting by Extension or by Direct Action upon the Ovaries:

1. Pelvic peritonitis and cellulitis.
2. Uterine disease.
3. Tubal disease.
4. Rectal disease.
5. Uterine traumatisms.
6. Infectious diseases:
 - (*a*) Scarlatina.
 - (*b*) Measles.
 - (*c*) Small-pox.
 - (*d*) Mumps.
 - (*e*) Cholera.
 - (*f*) Diphtheria.
 - (*g*) Erysipelas.
 - (*h*) Dysentery.
 - (*i*) Gout and rheumatism.
 - (*j*) Typhoid fever.
 - (*k*) Relapsing fever.
 - (*l*) Puerperal diseases.
 - (*m*) Syphilis.
 - (*n*) Gonorrhea.
7. Traumatisms.

1. *In Pelvic Peritonitis and Cellulitis* a condition known as

[1] Continued from p. 225, August number.

peri-oöphoritis may occur, which in time extends to the ovarian tissue proper. In those instances of old pelvic masses not dependent upon pelvic induration due to a cellulitis, we find frequently the tubes and ovaries involved, presenting in the case of the former thickenings and distentions of the tube by either serum or pus, and in the case of the latter enlargement or atrophy, induration, and fibrous degeneration with follicular changes, a condition of combined interstitial and follicular inflammation. In 9 of my cases peri-ovarian inflammation had previously existed, as shown by uterine adhesions, pelvic masses, and Fallopian-tube diseases. Besides, there were quite a number of compound uterine displacements, as we have seen, which indicated the more than likely pre-existence of peri-uterine inflammation to account for their presence. The direct relation of the oöphoritis and the peri-uterine inflammation was extremely difficult to determine—whether the changes existed as part of one and the same process, or whether the one or the other was primary or secondary.

2. *Uterine Disease.*—We have seen how frequently chronic oöphoritis exists with subinvolution and its sequel, hyperplasia. In such cases there cannot be said to have been any extension of disease, the two conditions existing rather as part of a universal fault of involution, the one reacting on the other, however, as part of a vicious circle. That oöphoritis is often dependent upon pre-existing uterine trouble there is no doubt; that it frequently is the result of extension must be admitted. As we shall see, many of the causes about to be discussed act in this way, using the uterine tract as a mere pathway to the tubes and ovaries. But independent of these we find cases where for some time there has been old endometrial trouble, which, without any apparent determinable cause, slowly advances along the tubes to the ovaries, producing peri-ovarian and ovarian inflammation, ending in dilated tubes and chronic oöphoritis. Thus in 22 of my cases this seemed to be the mode of production of the disease, chronic endometritis having long existed, to be followed by chronic ovarian inflammation. Coexisting endometrial disease with oöphoritis is extremely common, though, as a rule, they stand in the relation to each other as either parts of a similar process, or, what is most likely, the endometritis is secondary to the oöphoritis. Endometritis, either cervical or corporeal, is found in over 50 per cent of all instances of oöpho-

ritis, while villous endometritis and mucous cervical polypi occasionally are present.

3. *Tubal Disease.*—In chronic tubal disease chronic ovarian trouble almost invariably coexists, as a secondary affection usually, though sometimes present as the primary affection; the former is the rule, the latter the exception. Existing as the result of extension from the tubes, at first as a peri-oöphoritis generally, by the pressure or displacement of adhesions or by ultimate involvement of the interstitial or follicular structures of the glands, it ultimately induces a condition of chronic oöphoritis with final cirrhosis and atrophy of these bodies. According to Mignon,[1] who has carefully, both clinically and histologically, investigated this subject, the ovaries almost always participate in tubal disease, and may exhibit oöphoritis or peri-oöphoritis, cystic degeneration, cicatricial contraction, or atrophy with disappearance of the glandular tissue. Atrophy of the ovaries is also found in some cases in which the uterine adnexa are embedded in solid and extensive false membranes. Thirty-five times did Fallopian-tube disease coexist with chronic oöphoritis in my 250 cases: 15 times as a pachysalpingitis, 18 times as a hydrosalpinx—12 times being left-sided, 5 times right, and once bilateral—while in 2 cases there was pyosalpinx. In how many other cases there was a simple catarrhal state of the tubes I am unable to say, for I am free to confess that such a condition, when slight and uncomplicated and not coexisting with other tube diseases, is beyond my diagnostic ability. No doubt it was present in a considerable number of cases, but, giving rise to no special symptoms distinguishable from those of the uterine or ovarian maladies which it accompanied, it was undetected and undiscoverable. Besides the 35 mentioned there were 12 other cases in which adhesion of the tubes to the surrounding parts was present. Thus we have a total of 47 cases of involvement of the tubes, or in 18.8 per cent of all cases of chronic oöphoritis we may expect to find tubal or peritubal disease.

4. *Rectal Inflammation.*—Personally I have never met with such a case, but Scanzoni, according to Olshausen, frequently observed the disease after acute inflammations of the rectum. Such a condition is possible in the left ovary, which, resting on the rectum in health, may thus, by contiguity of tissue, become

[1] New York Medical Journal, September 7th, 1889.

the seat of disease. That such an origin for chronic oöphoritis is frequent is very much open to doubt.

5. *Uterine Traumatisms.*—By this is meant operations upon the uterus, especially the cervix, uterine applications, instrumentation, and other forms of uterine examination. Operations upon the cervix seem to be of especial importance here; this fact has also been noted by Duncan. Five times did the disease, in my experience, follow operation for laceration of the cervix, three times it was secondary to dilatation of the cervical canal, and once it followed sewing the cervix to the anterior vaginal wall. Once the disease seemed to succeed the passage of a sound, and on several occasions I have removed pessaries from the vagina and found a prolapsed, inflamed ovary, but was very doubtful, from the history of the cases, of the dependence of the disease for its origin on this cause. Such causes as the foregoing act in one of two ways: either by inducing a septic process along the lymphatics, or by direct extension of inflammation from the seat of injury along the tubo-uterine tract, which practically amounts to a septic infection by extension, as in the first instance. Other forms of traumatism mentioned are incisions of the cervix, the use of stem pessaries, curettings, etc. Of these the last only has come under my notice as a possible cause. In one case the patient had her cervix divulsed and had been twice curetted, all these at different sittings.

6. *Infectious Diseases.*—With Tait I believe that acute oöphoritis is not an uncommon complication of many of the exanthemata. Chronic oöphoritis as a sequence of this acute process may and does sometimes occur, but the frequency of this sequel it is impossible at present to determine. Tait particularly instances among the infectious diseases small-pox and scarlatina. He refers to an outbreak of small-pox occurring in Birmingham between the years 1872 and 1874, during which he met with a number of instances of oöphoritis terminating in atrophy of these bodies. But little attention has been directed to this origin of ovarian disease. Rarely referred to in works on pediatrics—for it is in the young that such complications are most apt to be met with—it is not surprising that the gynecologist has failed, as a rule, to detect or describe it. There are not a few instances of emansio mensium which present themselves for treatment, where a small, undeveloped uterus is found, while the ovaries either cannot be felt or when felt are

small and functionless, in which I have no doubt an oöphoritis ending in atrophy, occurring during the course of some infectious malady, was the original cause of the amenorrhea; the symptoms of the primary disease, however, overshadowing and hiding those of its complication. It has been my fortune to meet with quite a number of such cases of emansio mensium, but, as a rule, the patients themselves were unable to throw any light upon the matter. Sometimes the patients were generally undeveloped, being small in body, flat-chested, infantile-looking; but, as a rule, the general development was good, not a few presenting fair types of womanhood. Some of them, to my mind, owed their immature genital state to an infantile oöphoritis, always undetected, which produced destruction of follicles, atrophy of the gland, and as a sequence atrophy or impeded development of the uterus, etc. There are other cases where Nature makes an effort to remedy the defect. Molimina occur either regularly or generally irregularly, the ovaries endeavoring to perform their functions, but there is no menstrual flow and the effort results in naught but failure. In still other cases ovulation with menstruation occurs at long intervals, once, say, in eight or nine months; a mere show of blood for half an hour or several hours presents itself, while in the interval there is neither ovulation nor menstruation, molimina, etc., being absent. All these, I believe, are instances of atrophic oöphoritis, complete or partial, the primary lesions being in the follicles. If these be entirely destroyed we have complete atrophy of the glands and irremediable amenorrhea; if some of the follicles remain intact a partially successful effort at functionating occurs at various intervals. The uterine atrophy or lack of development is a sequence of the ovarian atrophy. Of course the foregoing refers to instances where menstruation has not yet been established. We know that in such cases the ovaries may be functionally active, and, such being the case, it is conceivable how an inflammatory process may attack these glands with subsequent destruction of their active elements. There are also cases where ovaritis has occurred during infectious maladies in adult females; I as well as others have met with such. How frequently it does take place in the present state of the subject it is impossible to decide, but that it is more common than is supposed is more than likely when it is stated that five such instances have come under my observation where the patients

themselves blamed a previous acute infectious disease for the amenorrhea for which they presented themselves.

(*a*) *Scarlatina.*—Oöphoritis in this affection may arise in one of two ways: either by extension of the dermal inflammation along the genital tract, or by direct action of the scarlatinous morbific agent upon the gland itself. The most frequent condition met with in women in the early stages of scarlatina is moderate catarrh of the vagina with hyperemia of the mucous membrane, without ulceration—this according to Thomas, who also states that these conditions are less often found in young girls. But Roger has found the testes and the tunica albuginea very hyperemic and somewhat softened, and Weber found both testes inflamed. Such being the case in boys, an analogous condition must be admitted as possible in the ovaries. Hennig has observed hyperemia and infiltration of the ovaries and tubes in scarlet fever. Peri-uterine inflammation appears with remarkable frequency in cases of scarlatina occurring during the puerperium. Thus Meyer records six such instances of peri- and parametritis. Henoch speaks of leucorrhea developing in a few cases in children immediately after scarlatina, probably from extension of the dermatitis to the mucous membrane of the genitalia. Eichhorst states that oöphoritis and peri-oöphoritis are not infrequently observed in this disease. Slavjansky, than whom no one has made a more careful study of the endometrial and ovarian changes of the acute infectious fevers, found endometritis and oöphoritis in such cases, and claims that the oöphoritis occurring during these maladies is a true parenchymatous inflammation, the lesion in the acute forms being near the periphery of the glands in the cortical zone and confined almost entirely to the primordial follicles, while in the chronic forms it is limited to the more mature Graafian vesicles. The ultimate result is destruction of the follicles, providing the inflammation is intense, otherwise the gland may return to its normal condition. Lebedinsky also found, on examination of the ovaries after scarlatina, that the follicles presented at first the microscopical appearances of parenchymatous inflammation in all stages, the final result being destruction of a larger or smaller number of follicles with the formation of cicatrices, with consequent suspension of the ovarian function to a greater or less degree. Pathologically it is thus proven that oöphoritis is a complication of scarlatina; clinically it has yet to be

demonstrated. Tait reports a case where the oöphoritis followed scarlatina occurring after a second labor. Operation revealed the ovaries to be in a state of cirrhosis. Personally I have never been able to establish a positive connection between the existing ovarian atrophy and scarlatina, but have no doubt that such a connection could be established were patients but able to remember their previous histories with sufficient exactitude. In fact, most of the cases coming under notice are unable to tell whether or not they had ever suffered from any of the exanthemata.

(*b*) *Measles.*—Parrot[1] describes a form of vulvitis occurring in children, which he names aphthous, basing his description upon quite a large number of instances. Of the 56 cases observed, no less than 39 were associated with measles, 4 with pertussis, 1 each with varicella, erysipelas, pneumonia, and diphtheria, and 9 independent of any other disease. Acute endometritis has been noted in connection with measles. Extension may therefore be presumed as possible along the genital tract, but, so far as I know, there are no records of oöphoritis occurring during or after the disease.

(*c*) *Variola.*—Tait[2] remarks: "I have no doubt that there is a special form of oöphoritis associated with certain exanthemata, more particularly scarlet fever and small-pox, and that in its results it differs altogether from the form of ovarian inflammation to which I prefer to give the name of peri-oöphoritis." In an epidemic of variola occurring in Birmingham during the years 1872 to 1874, he says that he was four times called in consultation to cases of pelvic ailment complicating the disease, one an instance of double acute ovaritis followed by abortion, in whom the menses never reappeared; another, probably suffering from a similar complaint, with similar subsequent atrophy of the ovaries, who menstruated later only at long intervals. No doubt the process is the same here as that already referred to as described by Slavjansky and Lebedinsky: an acute inflammation of the follicles, either partial or complete, with subsequent destruction of the vesicular structures, atrophy, and loss of function. This may depend upon direct action of the poison of the disease upon the glandular structures, may follow variolous pelvi-peritonitis and peri-oöphoritis, or may, it is conceivable, be secondary to extension of the variolous dermatitis along the

[1] Rev. de Méd., March, 1881. [2] "Diseases of the Ovaries," 1883, p. 102.

genital tract. Nonat, for instance, lays particular stress upon the fact that the variolous eruption sometimes presents itself with remarkable intensity about the vulva, which may result, during the late period of the exanthem, in extensive and deep ulceration.

A case of amenorrhea following variola, and undoubtedly dependent upon a complicating oöphoritis with consecutive atrophy of the glands, and coming under my care, is the following:

Rosa S., æt. 26 years, German by birth, and married three years. Began to menstruate at the age of 16 years; was always regular, though the flow was always accompanied by great pain. At the age of 21 years she suffered from an attack of small-pox. Up to that time she had menstruated regularly, but thereafter she never again saw a sign of the flow. For some time after recovery from the disease she noticed marked molimina, but these have now entirely disappeared. She is of good size and development, and appears to be in very good general health. She complains only of slight pain in the lower abdomen, and suffers some from dyspareunia, though she comes only with the hope of being relieved of her amenorrhea. The uterus was found of normal shape and in the normal position, and was about the natural size, being two and a half inches in depth. Cervix normal in size and shape, but slightly eroded and the seat of catarrhal trouble. The ovaries could not be felt. The vagina and external genitals presented no abnormality. Treatment during two and a half months was without result.

(*d*) *Mumps.*—Reasoning from analogy, it has been claimed that parotitis may originate an oöphoritis. Orchitis being comparatively common in certain epidemics, a like condition has been presumed to occur in the ovaries. Facts relating to this point are hard to obtain, but very few references thereto being found in the literature. Eichhorst speaks of pains and even enlargements of the ovaries, swelling and hematoma of the vaginal mucous membrane and labia, as having been observed in mumps. Leichtenstein mentions catarrh of the vagina as a rare complication. Dunn reports four cases of mumps with inflammation of vagina and purulent discharge following. Isham,[1] speaking of the complications of mumps, remarks: "While it is asserted by some systemic writers that transference of the dis-

[1] Amer. Journ. of the Med. Sci., October, 1878, p. 872.

ease process to the ovaries never transpires, others place it next in frequency after affection of the mammæ. The literature of the subject is exceedingly scanty. No citation of cases is given in works, and we have only found three cases reported in the journals, two by Demarest and one by Meyer."

(*e*) *Cholera.*—Slavjansky has found in this disease an oöphoritis entirely similar to that already described under the head of scarlatina: a true follicular inflammation following an analogous course with a like termination. Endometritis has also been noted as occurring during the disease. Among 27 cases of early menopause Tilt mentions two instances where such cessation followed cholera, but gives no details.

(*f*) *Diphtheria.*—Vaginitis diphtheritica has been noticed by various authors, as Rokitansky, Klebs, Schröder, and others, with occasional implication of the cervical mucous membrane. Lebert refers to a diphtheritic endometritis occurring during the course of cholera Asiatica. I do not find any instances of oöphoritis recorded in literature, but in the light of our present knowledge such a possibility from extension must be borne in mind.

(*g*) *Erysipelas.*—Much has been written of the connection between this disease and puerperal fever. That it may give rise to peri-uterine inflammation there is no doubt, and with this, as a part of the process, we undoubtedly may have oöphoritis. Given an instance of erysipelas of the perivulval parts, extension along the genital mucous membrane to the ovaries, causing peri-oöphoritis and final parenchymatous oöphoritis, is easily conceivable. Eppinger has observed an instance of vaginitis erysipelatosa.

(*h*) *Dysentery.*—Vaginitis dysenterica has been observed by both Klebs and Eppinger. The latter examined twelve cases, in all of which intestinal dysentery existed, the extension of the process being supposed to be due to patency of the introitus or narrowness of the perineum. Sänger speaks of Hennig[1] in a girl of 10 years, and Eppinger[2] in an adult, witnessing a dysenteric inflammation extend to the mucous membrane of the genital tract, the disease in its new location assuming the appearance of a diphtheritic inflammation. Massin,[3] among 18 cases of infec-

[1] Krankheiten der Eileiter, p. 67.
[2] Prager Zeitschr. für Heilkunde, 1882, p. 86.
[3] Archiv für Gynäkologie, Band xl., Heft 1, 1891.

tious disease investigated with especial reference to the condition of the endometrium, examined one instance of dysentery. Here, as well as in the other cases, he found a parenchymatous and interstitial inflammation of the mucous membrane. Furthermore, in all cases a condition was observed corresponding to the hemorrhagic endometritis noted by Slavjansky in cholera. Though no such cases are reported, oöphoritis as a secondary result of such endometritis is a possibility.

(*i*) *Gout and Rheumatism.*—Attention has been called by Mabboux, of Contrexéville, to a condition which he deems by no means rare. He and Roubaud [1] claim that gout of the ovaries is frequently met with by the physicians stationed at the warm springs. They conclude that during and after sexual life there may exist a gouty metritis, vaginitis, and vulvitis, that these attacks may or not accompany the menses, and that utero-ovarian gout demands the same medication as articular or visceral gout.

An instance of ovarian atrophy, probably dependent upon oöphoritis following an attack of rheumatism, has come under my notice.

Sarah I., æt. 35 years, a native of Hungary; married twice, the first time three and the second time four years, with an interval of ten years between. Had one child ten and a half months after her first marriage, none since. Always menstruated regularly and without pain up to six years ago, when she had an attack of rheumatism complicated by pericarditis. Since then menstruation has been extremely irregular and scanty, often remaining entirely absent fully eight months. At present has had no sign for six months. During the intervals no molimina. Uterus in normal position and of about normal shape, but very small; the sound could not be introduced, more especially on account of the minuteness of the external os, which would not admit its tip. The cervix itself was very short, and the ovaries could not be felt. Here, it seems to me, we are dealing with an instance of ovarian inflammation with secondary atrophy similar to that described as occurring in other infectious diseases by Slavjansky, Lebedinsky, Tait, and others. Tait, in fact, records a case of chronic oöphoritis due to acute rheumatism. It occurred in a girl of 17 years who had suffered from eight or nine attacks of rheumatic fever. She died subsequently of embolism of a cerebral artery, and on post-mortem he found the ovaries

[1] Gaz. de Gynécologie, August 1st, 1888.

large, soft, covered with lymph, and dotted with enlarged follicles, and the peritoneum was thickened around them. The left ovary was partly adherent to the rectum, and it had nearly all the fimbriæ of the corresponding tube glued on to it.

(*j*) *Typhoid Fever.*—Massin, already quoted, has examined two cases of enteric fever, and found the uterus the seat of a parenchymatous and interstitial inflammation of its lining membrane, while its muscular coat also showed interstitial inflammatory changes. Jaggard[1] is of the opinion that, owing to some change in the constitution of the blood, the predisposition in the acute infectious diseases is to the development of a hemorrhagic form of endometritis. Herman,[2] commenting on the endometritis occurring during the course of typhoid, typhus, etc., remarks that in the acute stage of these maladies the symptoms caused by the endometritis are so slight in comparison with those of the graver disease they complicate that they seldom attract attention at the time, but later on indicate their previous existence by amenorrhea, dysmenorrhea, menorrhagia, or sterility. Liebermeister has noticed diphtheritic (?) endometritis during typhoid fever. In one instance he found serious hemorrhages in the ovaries, and in another purulent degeneration of one ovary. Slavjansky has also found here the usual parenchymatous ovarian inflammation so characteristic of the acute infectious maladies. Cessation of menstruation for a longer or shorter period after recovery from typhoid fever is not uncommon, but its permanent absence is rather rare. In the former case the amenorrhea is purely symptomatic of the secondary anemia; in the latter it is undoubtedly dependent upon destruction of the vesicular structure of the glands and consecutive atrophy. I have twice met with cases of amenorrhea following typhoid, but in neither case had the affection existed long enough to determine positively whether the condition was to be permanent or temporary.

Mary S., æt. 24 years, born in New York, and married one and a half years. Miscarried two months after marriage, in about the second month of pregnancy, but was perfectly well thereafter. Began to menstruate at 14 years and was always regular. Had typhoid fever six months before coming under observation, followed immediately, she says, by scarlatina. No

[1] Pepper's "System of Medicine," vol. iv., p. 461.

[2] Brit. Med. Journ., February 1st, 1890, p. 221.

menstruation since; no molimina. Patient declined examination.

Leah S., æt. 30 years, born in Roumania, and married twelve years. Has had six children, the last two years ago. Began to menstruate at 15 years; always regular and free of pain. About eight months before presenting herself, suffered from an attack of typhoid fever, and since then has not menstruated. Uterus of normal size, shape, and in normal position. Ovaries could not be palpated.

(*k*) *Relapsing Fever.*—Endometritis hemorrhagica has been shown to be a complication of this form of disease (Massin, Slavjansky). Acute parenchymatous inflammation of the ovaries is also not rare, but its chronic or atrophic condition has not so far been met with. The form of oöphoritis occurring during this disease is that already described as existing in the other infectious maladies, as shown by Slavjansky and Lebedinsky.

(*l*) *Puerperal Diseases.*—Ovaritis is particularly common after labor, whether at term or after abortion; occurring most frequently as a secondary process, either consecutive to an acute metritis or peri- or parametritis, or as part of the pathological changes of a puerperal fever. Among 686 cases of puerperal metro-peritonitis, Boivin and Dugés found the ovaries inflamed 37 times. Robert Lee, upon 56 women succumbing to puerperal fever, found the ovaries involved 32 times; while Tonnellé, upon 222 cases of the same disease, observed these organs to be inflamed in 58 cases. Of my 250 cases of oöphoritis 19 per cent traced back their trouble to labor at term, while 15.6 per cent claimed an abortion as the origin of their sickness. Besides these, 6.1 per cent gave histories of a pelvi-peritonitis or cellulitis beginning during the puerperal period. Hence no less than 40.7 per cent blamed labor or one of its accidents for their malady. Abortions are more apt to be followed by oöphoritis than labor at term; the ratio of the former being about one case to four of abortion, of the latter one to five, as given by the cases under my care. This is as was to be expected from the well-known fact that interrupted pregnancies are more commonly followed by pelvic inflammations than full-time deliveries.

(*m*) *Syphilis.*—Syphilitic inflammation of the ovaries is extremely rare. Among all my cases, in not one could this dis-

ease be said to have produced any influence. However, Bäumler[1] says: "Inasmuch as fibrous degeneration of the ovaries, especially in advanced life, is so commonly met with, cicatricial changes in these organs can only be regarded as the result of syphilis when there are other circumstances which point to the disease—as, for instance, in youthful persons who bear decided evidences of syphilis elsewhere. Such changes have been described by Richet, and a case of gummatous ovaritis, which is perfectly analogous to the similar affection of the testicle, is figured by Lancereaux."

(*n*) *Gonorrhea.*—There is no doubt that gonorrhea plays an important part in the development of genital disease in the female, but how much of a rôle it plays in the production of ovarian inflammatory disease is still an unsettled question. That it does produce such is positive, but whether it occupies a commanding place as a cause of chronic oöphoritis is more than problematic. Of my 250 cases, in only 4.1 per cent could a positive relation between the two diseases be established. In the class of cases from which these patients were drawn infidelity on the part of the male is not uncommon, and acute gonorrhea was not uncommonly met with. Thus, in from 10 to 12 per cent of all my gynecological cases gonorrhea, in either its acute manifestations or in some of its sequelæ, was present on beginning treatment. If it be true, as is claimed by some, that salpingitis is almost always, if not always, dependent upon the extension of a pre-existent gonorrhea along the mucous membrane of the uterus, the number of my cases of oöphoritis due to this malady must have been larger than is above indicated; for, as has already been shown, involvement of the tubes was detected in no less than 35, or 14 per cent of all such cases.

Of late much has been written about the evil influences of gonorrhea as a disease-producer in the female, but the recognition of its powers in this direction is really nothing new; the only advance, if advance it be, being the erecting it into an almost universal cause. All cases not dependent upon the puerperal state are now presumed by not a few to be due to the gonorrheal germ making its way along the genital tract. Long ago Morgagni[2] mentioned a case reported by Panaroli, who found abscess in both ovaries of a woman who had long suffered from gonorrhea. Ricord, Vidal de Cassis, Nonat, Acton, Lisfranc,

[1] Ziemssen's "Cyclopedia," vol. iii., p. 232. [2] Epistle 44.

Tilt, and others admit the occurrence of a gonorrheal ovaritis. Simpson, on the authority of Tilt,[1] states that an examination of several hundred cases of gonorrhea in the Lock Hospital of Edinburgh revealed only one doubtful case of ovaritis. Of 99 cases of pelvi-peritonitis analyzed by Bernutz, 28 were blennorrhagic in their origin, though this large proportion of such cases, it must be remembered here, is explained by the character of the hospital where the patients were seen. These cases occurred among a total of 93 instances of gonorrhea—that is, once in about 3½ cases. But this average is too large, as is stated by Bernutz himself; for there were special reasons why only such patients, at certain times, who presented symptoms of perituterine phlegmons could be admitted. In how many of these cases the ovaries were involved is not stated, but that a causative relation was recognized is shown by the following quotation:[2] "It negatives the opinion of Hunter as to the absolute impossibility of the existence in the female of an affection analogous to orchitis in the male; it shows, on the contrary, that this affection is very common—much more so, indeed, than might be gathered from Ricord's description of blennorrhagic ovaritis." Commenting on a paper read by Dr. Henry Bennett before the Medico-Chirurgical Society in 1848[3] on "Inflammation and Abscess of the Uterine Appendages," Mr. Acton stated his belief that these inflammations of the Fallopian tubes and ovaries were analogous to swelled testicle in the male and frequently came on as a sequence of gonorrhea. The adhesions produced by these extensions of gonorrheal inflammation he believed to be a frequent cause of the sterility of prostitutes. Dr. Bennett was hardly willing to adopt this interpretation, apparently doubting the frequency of such occurrence. Sänger,[4] among 1,930 gynecological cases in public and private practice, found in 230, or 11.9 per cent, gonorrhea to be the initial cause of the malady for which they presented themselves. In 161 additional cases the diagnosis of gonorrhea was positive in 22, or 13.7 per cent. In these cases the diagnosis was purely a clinical one. E. Schwarz, of Halle,[5] among 617 carefully ob-

[1] "Diseases of the Ovaries," p. 315.

[2] "Clinical Memoirs of the Diseases of Women," vol. ii., p. 57.

[3] Medical Gazette, February 11th, 1848, p. 243.

[4] Arch. für Gyn., Bd. xxviii., S. 476.

[5] "Die gonorrhoische Infektion beim Weibe," Sammlung klinischer Vorträge, Leipzig, 1886.

served uterine cases found 112 instances, or 18.2 per cent, which excited suspicion of a previous gonorrhea. Of these, 33, or 5.3 per cent, were still in the acute stage of the malady, and all presented the gonococcus. Of the remaining 79 the gonococcus was demonstrated in 44 cases. Thus in 77 patients, or 12.5 per cent of all cases, gonorrhea was positively proven present. We thus note a close correspondence between the results obtained clinically by Sänger and those given by the microscope as demonstrated by Schwarz. Accordingly we may conclude that in fully 12 per cent—which agrees with my clinical experience—of all gynecological cases gonorrhea is the determining cause. This, of course, refers to adult cases. But that children also may be the victims of the disease is shown by the following. Pott,[1] during twelve years among 8,481 girls, met with 86 instances of vulvo-vaginitis, 56 being 5 years of age, 23 from 5 to 10 years, and 7 from 10 to 15. According to Pott the disease is mostly a specific one, due to gonorrheal infection, the communication being usually through the medium of sponges, soiled bed linen, etc.; direct communication being rare, but three such cases having been observed. In some instances several children in one family were affected. Cseri and Israel have found gonococci in the secretions from such children. Thus the former[2] examined the discharges in 26 cases of vulvo-vaginitis in young girls, and in every instance found a diplococcus bearing a striking resemblance to Neisser's gonococcus. Prochownick also has found gonococci in 17 out of 21 cases of vulvo-vaginitis in children, while F. Späth[3] found the Neisser coccus in 14 of 21 cases of such disease in girls between the ages of 3 and 11; in 11 of these cases the mother also was the victim of gonorrhea, in 2 the father, and in 3 only had the child been violated. J. W. Williams[4] claims that vulvo-vaginitis in children is quite frequent, occurring in about 1 per cent of all dispensary cases, most cases being in all probability of gonorrheal origin. Both Späth and Williams speak of the possibility in these cases of the infection passing upward along the genital tract and thus giving rise to endometritis, salpingitis, etc. Sän-

[1] Archiv für Gynäk., Bd. xxxii., Hft. 3.
[2] Wiener med. Wochenschrift, 1885, Nos. 22 and 23.
[3] Münchener med. Wochenschrift, May 28th, 1889.
[4] Maryland Medical Journal, June 11th, 1892.

ger[1] speaks of occasionally meeting with instances of pyosalpinx and pelvi-peritonitis in young girls, and believes these are generally due to a gonorrheal infection, having himself met with a comparatively large number of girls of all ages, from infancy to puberty, who were infected with gonorrhea.

The great modern apostle of gonorrhea as a causative agent in the production of female ailments is Noeggerath, whose views were first announced as long ago as 1872. He claims, among other things, referring to what he terms "latent gonorrhea in the woman," that the disease manifests itself in the course of time by perimetritis, acute, chronic, or recurring; by ovaritis; by catarrh of some portion of the genital mucous membrane; absolute sterility being the rule, or, if pregnancy occur, either abortion or one-child sterility is the result. Exceptionally three or four children are born.

Schmidt,[2] among 116 cases of gonorrhea in the female, noted in 27 symptoms pointing to secondary inflammatory changes involving the pelvic organs—that is, pelvic peritonitis. Martin,[3] among 287 cases of tubal disease, complicated in 122 cases with morbid conditions of the pelvic peritoneum, ovaries, and broad ligaments, found 55 that were caused by gonorrhea. According to Sinclair, if the disease, gonorrhea, reach the fimbriated extremity of the tubes, it almost certainly goes on to the production of perimetritis and oöphoritis. Bumm is of those who doubt the occurrence of a true gonorrheal peritonitis, claiming that the gonococcus can penetrate into cylindrical epithelium only; that on pavement epithelium gonorrheal pus, acting simply as a foreign body, becomes encysted, but never leads to a true inflammation. If peritonitis arise in such a case the cause is not the gonococcus, but is rather the result of mixed infection—that is, a secondary infection by the ordinary pyogenic microorganisms. Thus Bumm writes: "It is astonishing with what frequency in gonorrhea patients para- and perimetric processes are found. The microbes of gonorrhea do not directly invade the lymph tracts and the connective tissue about the uterus and cause inflammation and exudation. The territory of the gonococcus is more limited to the superficial layers of the mucous membrane. Gonorrhoic para- and perimetritis cannot be ex-

[1] American Journal of Obstetrics, March, 1887, p. 825.
[2] Archiv für Gynäk., Bd. xxxv., S. 1.
[3] Berliner klin. Wochenschrift, 1887.

plained by the action of gonococci; there must be therefore another agent, which, under the influence of the infection of the mucous membrane, passes into the parametric tissues and there causes disturbance." He concludes: "Purulent parametritis with gonorrhea of the cervix is due to a mixed infection with pyogenous bacteria; it is the analogue of the acute gonorrhoic bubo in the male, which likewise owes its origin to pyogenous germs." If all this be so there can be no true gonorrheal peri-oöphoritis with consecutive inflammation of the ovarian stroma, but rather the process becomes a simple inflammation, such as occurs from ordinary causes. Wertheim, however, controverts this position, showing beyond a doubt that gonorrheal infection may affect peritoneum and ovaries. He furnishes proof that the gonococci can penetrate into pavement epithelium, as well as also into connective tissue, by following the tissue and lymph spaces. As positive proof of the fact that ovarian inflammation may depend directly upon infection with the gonococcus of Neisser, he relates two cases of ovarian abscess in which these bacteria were found. The first case was a left purulent salpingitis with patent abdominal ostium, and fimbriæ partially adherent to the ovary, which was the size of a hen's egg and its tissue thickened throughout. This ovary contained a filled pus cavity of about the size of a nut. In the tubal pus no bacteria could be demonstrated either by the microscope or by cultivation; but the pus from the ovarian abscess contained numerous gonococci with all their characteristic peculiarities. Cultivation on human blood serum furnished pure cultures of the gonococcus, but no other bacteria. As there was absolutely no communication between the tube and the cavity in the ovary, he concludes the gonoccoci must have penetrated through the ovarian tissue into its depth, where they set up suppuration. The second case was that of a girl, aged 16, with bilateral gonorrheal pyosalpinx. The abdominal ends of both tubes were closed, and numerous gonococci were found in the pus of both sides. Both ovaries were enlarged to the size of hens' eggs and tensely filled with pus. Numerous gonococci were demonstrable in the pus from the right ovary by the microscope and by cultivation, but no other bacteria. No bacteria of any kind whatever were discoverable in the pus from the left ovary either by the microscope or by cultivation. Here, too, no communication existed between the lumen of the

tube and the ovarian abscessee. The conclusion, therefore, to be drawn from the foregoing is that true gonorrheal oöphoritis does undoubtedly occur, but that in a considerable number of cases, probably the majority, the ovarian inflammation appearing after such gonorrheal infection is dependent upon the ordinary germ of inflammation and not upon the gonococcus. As before stated, about 12 per cent of all my gynecological cases were the victims of gonorrhea, either in its acute or chronic stage, and of the cases of oöphoritis 4.1 per cent followed such infection. The total number of gynecological patients being 5,262, 12 per cent would give us 632 cases of gonorrhea as against 12 cases of gonorrheal oöphoritis; that is, the latter disease is consecutive to about 2 per cent of all gonorrheal cases. Or, again, of the total number of gynecological cases about one-quarter of 1 per cent will be found to be suffering from oöphoritis secondary to a gonorrhea.

7. *Traumatisms.*—These figure only to a very small extent in the production of oöphoritis. Irrespective of those inflicted upon the uterus itself, which secondarily may produce ovarian inflammation, traumatism rarely, if at all, is here operative, such a cause being far more likely to produce peritonitis than oöphoritis. Of course this latter may follow as a sequel or complication of the former, but as an independent entity due to direct injury oöphoritis must be uncommon indeed. Falls on the feet or sacrum, blows on the abdomen, jolting or overlifting, all have been blamed. One of my patients traced her trouble back to a kick in the abdomen, but close questioning revealed the fact that she had long suffered from pain over the ovary, which the blow had simply aggravated. In two other cases the patients thought their trouble followed overlifting; but this is so often advanced as a cause by women to explain the existence of whatever uterine malady they may be suffering from, that its powers must be looked upon with suspicion, just as we often doubt the activity of cold in the production of many maladies.

Symptoms.—As a rule the diagnosis of chronic oöphoritis is quite an easy matter. The rational symptoms generally arouse our suspicions as to the character of the disease we are dealing with. The ovarian pain, the dysmenorrhea, the dyspareunia, the painful defecation, the sickening sensation, the nausea, all direct our attention toward the ovaries. But as the disease rarely exists in an uncomplicated state, almost always coexisting

with some other uterine malady, the rational signs are masked considerably by the symptoms of these latter complaints, so that a diagnosis on the rational signs alone is purely problematic. However, a resort to a physical examination will positively settle the matter, for by the symptoms elicited by the touch alone can a positive conclusion be reached. The degree and intensity and persistence of the purely rational symptoms vary greatly. Some cases are marked by the mildness and intermittence of the symptoms, others by their severity and persistence. The physical signs vary but slightly, except just before the appearance of the menses, when they are observed at their acme. The rational symptoms also are frequently intensified at this time. The symptom which usually brings the patient is pain, whether in one form or another, be it (1) ovarian pain proper, (2) back pain, (3) dysmenorrhea, (4) dyspareunia, (5) painful defecation, (6) dysuria, (7) mammary pain, (8) pain at various other distant points.

1. *The Ovarian Pain.*—In the vast majority of cases it is this symptom which drives the sufferer to the physician. Usually continuous, it has its times of exacerbation. In very few cases is it absent. Its character varies considerably, though its seat is pretty uniform. Generally existing over one or the other ovary, it is sometimes complained of over both, though even then being generally most marked over one or the other ovary. Its most common seat is the left side. Tait claims it to be here noticed with much greater frequency than on the right. Thus he says:[1] "Pain is an inevitable feature, and nineteen times out of twenty it is worse on the left side than on the right; and if it exist on one side only, it is almost certain to be the left which is affected." This is true to a considerable extent, though not to the extreme degree Tait would have us believe. For in my 250 cases, having carefully examined into this point, it was found that in 59.1 per cent the pain was complained of over both ovaries, most frequently, however, more so over the left than the right side; in only 13.8 per cent was it felt over the right ovary alone; while in 27.1 per cent was the region of pain over the left gland. That it was twice as common over the left as over the right ovary is thus shown. Sometimes the pain is localized to the affected organ, but usually it is diffused over the abdomen, around to the back, or down the thigh. Most severe

[1] Loc. cit., p. 112.

over the diseased ovary itself, it is generally radiated over a rather wide area, in some few cases being complained of as far up as the shoulder on the affected side, or even down to the knee. When both ovaries are involved the left is the one where the pain is the greater; in fact, in some few such cases the pain was felt only on this side. The explanation is simple. Constipation is the rule in these patients. The left ovary rests upon the rectum with its contained hard fecal masses, while the right is surrounded by a coil of small intestines whose contents are fluid. The pressure of the distended rectum and the passing of the hard feces under it explain the greater severity and almost constant aching of the ovary on the former side. The character of the pain is usually peculiar, being of a sickening, depressing kind, though sometimes it is a simple aching, while at other times it may be of a burning character. It is rarely entirely absent, though at times slight; its periods of exacerbation are marked. Generally increased by much standing, walking, riding, or by violent exercise or exercise long continued, its period of most pronounced aggravation is a week or less before the appearance of the menses. At this time it frequently becomes almost unbearable, driving the woman to bed; but generally it is relieved at the beginning of the flow, though occasionally lasting for a few days longer. I have seen it so severe that it was utterly impossible for the woman to walk upright, the slightest pressure being unbearable. When reflected, its direction is usually around the groin to the back as a vague, indefinable, constant aching with a burning quality. Its next most frequent radiation is down the thigh. Upward is a rather uncommon direction. There is a form of pain, the so-called intermenstrual of Priestley, which has been said to be characteristic of oöphoritis. However, this is a symptom of exceedingly rare occurrence, and to my mind not specially indicative of ovarian trouble; in fact, in the only case where I have met with it, and in which it was well marked, it seemed to be due to the coexisting uterine trouble and not to the oöphoritis, for it persisted after all signs of ovarian inflammation had vanished. Nevertheless Thomas, Olshausen, Kugelmann, Tait, and Palmer all consider it symptomatic of ovarian disease, whether an oöphoritis or a peri-oöphoritis. Ovarian pain due to inflammatory changes in these organs is always and invariably increased by pressure, whether external or internal, the degree of increase being directly re-

lated to the intensity of the inflammation, other things being equal. If, however, peri-oöphoritis has occurred and the ovary is fixed, the aggravation of pain by pressure is out of proportion to the degree of inflammation of the ovary itself. This is the only exception to the foregoing rule that has come under my observation. Here we have several factors to produce this—viz., the pain of the ovarian disease proper plus the pain of the attending peritonitis, while, besides, the mere fixation of the ovary by this latter condition renders it much easier to make pressure and thus more easily elicit pain.

2. *Back Pain.*—This may exist as a simple radiation of the pain from the front, or, as is most frequently the rule, as an independent pain. When the latter is the case it does not usually depend upon the ovarian disease, but rather upon the uterine disease which coexists. Sometimes, however, it may be traced directly to the ovary, but then only where this organ is either prolapsed or fixed behind the uterus. Skene[1] is of the opinion that the symptoms in cases of retroflexion and retroversion are dependent in great part upon the condition of the ovaries. Thus he writes: "It is well known that displacements backward of the uterus cause but little trouble in some cases, while in others the suffering is intolerable and has been known to end in insanity. I am fully satisfied that the difference is to be attributed to the condition of the ovaries, because they are usually tender or diseased in the cases of displacements of the uterus which are attended with great derangement of the nervous system." This is true to a certain extent, but in the majority of cases no such explanation will be borne out by facts. Retrodisplacement without ovarian disease is common in my experience, and yet such cases give rise to aggravated symptoms, dependent directly, I have no doubt, upon the coexisting uterine disease. Contrarily, ovarian disease may exist with backward displacement of the uterus, the ovaries may even be descended behind the uterus, yet almost all, if not all, the symptoms will be referable to the ovaries, none to the uterus, and will be felt anteriorly, hardly any being referred to the back. Back pain is an extremely common symptom, existing in no less than 61.7 per cent of all cases of oöphoritis. It is usually referred to the sacrum, sometimes higher up; is of a boring, burning character; continuous usually, but subject to aggravations when constipated, during exercise, or when standing, and at

[1] AMERICAN JOURNAL OF OBSTETRICS, January, 1881, p. 65.

the time of menstruation. It is sometimes radiated down the back of the thighs, but is seldom extreme in degree, and then only when the ovaries are displaced downward and either caught in Douglas' sac or fixed there by adhesions. It is sometimes the symptom which brings patients to us; but this is rather uncommon, although I have occasionally had it complained of to the exclusion of the ovarian pain over the lower anterior abdomen.

3. *Dysmenorrhea.*—In most of the text books on gynecology we find described a form of dysmenorrhea which has been denominated ovarian, having as its characteristics the onset of the pain a few days before menstruation, and ceasing with the appearance of, or a short time after, the flow, having its seat over one or the other ovary, and being often of a peculiarly unbearable, sickening character, and at times accompanied by nausea and vomiting. In fact, we have here described the pain so indicative of ovarian inflammation, occurring simply as an intensification of the pain existing in these cases over the ovarian region. It has been denied by some that there is such a thing as true ovarian dysmenorrhea, but it has happened to me so often to meet with it, especially in these cases of chronic oöphoritis, that its existence must be admitted. In degree and kind it varies considerably, but its most marked character is the time of occurrence. Dysmenorrhea dependent upon ovarian disease always precedes the flow, and ceases very quickly after its appearance; but as in these patients uncomplicated ovarian inflammation is the exception, it is very apt to be merged into that indicative of disease of the uterus itself. Thus dysmenorrhea was present in no less than 74.5 per cent of all instances of oöphoritis coming under my care, but in only 36.4 per cent of all cases did the pain precede the flow, showing that true ovarian dysmenorrhea occurs only in a minority of the cases of oöphoritis. Hence it can hardly be considered a very prominent symptom of the disease, the dysmenorrhea which so often accompanies it, in fact, being rather indicative of uterine complications, since in no less than 62.7 per cent of all cases it was wholly or in part of the uterine kind. Often we have both the ovarian and the uterine varieties coexisting in the same case, the one merging into the other, the seat of pain in such instances being transferred from the sides to the centre of the lower abdomen, and changing from its sickening character to that of a spasmodic or labor-like quality. This was true of no less than

27.2 per cent of all cases. To indicate the coexistence of these various types of dysmenorrhea the following table has been arranged, comparing thus cases of chronic oöphoritis with the dysmenorrhea as it occurred in 1,000 consecutive, unselected gynecological patients:

Time of occurrence of the pain with respect to the menstrual flow.	Oöphoritis cases.	All gynecological cases.
Before	9.2 per cent.	7.5 per cent.
During	35.5 "	35.9 "
After	1.4 "	0.3 "
Before and during	23.5 "	16.0 "
Before, during, and after	3.7 "	3.8 "
Before and after		0.3 "
During and after		0 9 "
None	26.7 per cent.	35.3 "

A glance at this table will show how markedly oöphoritis influenced the time of appearance of the pain, thus proving positively the existence of a form of dysmenorrhea which can properly be denominated ovarian. The degree of pain varies greatly. In some cases it is extremely slight, in others so intense that the patients describe their suffering as something terrible. Experience has taught me that this is dependent on but one thing—the existence or non-existence of peri-oöphoritis. If the whole ovary be surrounded by peritonitic exudation, be immovably fixed, the suffering may be indescribable, due to the non-escape of a matured ovum with consequent distention of the ovary and tension upon the peritoneal adhesions. Sometimes the pain is variable, differing greatly at different menstrual periods. The explanation that offers itself to account for this fact is the existence of the disease in one ovary or part of an ovary, the matured ovum making its exit, when there is no pain, from the healthy ovary; when there is pain, from the diseased one. Tabulation gives the following, the results in the oöphoritis cases being again compared, as regards the severity of the pain, with those of the 1,000 general gynecological cases already referred to:

Degree of pain.	Oöphoritis cases.	All gynecological cases.
Slight	16.7 per cent.	31.1 per cent.
Moderate	6.9 "	8.9 "
Great	58.3 "	55.4 "
Intense	15.3 "	4.6 "
Terrible	2.8 "	

—showing the great influence of chronic oöphoritis upon the intensity of the dysmenorrhea. Where the pain has existed before marriage a markedly pernicious influence is often noticed. Of my 238 cases in married women the large majority were free of dysmenorrhea before marriage, but in 64.2 per cent the pain appeared after marrying, at longer or shorter intervals. In about one-quarter of all cases marriage failed to influence the suffering either one way or the other.

Dysmenorrhea, when appearing.	Oöphoritis cases.	All gynecological cases.
Before marriage only	1.6 per cent.	5.6 per cent.
Greater since marriage	10.9 "	3.8 "
Less since marriage	0.8 "	4.9 "
Since marriage only	64.2 "	47.3 "
Always the same	22.5 "	38.4 "

We here note the facts that in ordinary gynecological cases the influence of marriage upon dysmenorrhea is decidedly less marked than in cases of oöphoritis; that this symptom is originated in fully 17 per cent more cases in married women where oöphoritis appears than in the generality of gynecological cases; and that in fully 7 per cent more cases suffering from ovarian inflammation where existing before marriage, it is aggravated by this change in social condition.

4. *Dyspareunia.*—This symptom is very characteristic indeed of chronic oöphoritis, appearing in almost 80 per cent of all cases. Its presence should elicit a careful examination of the ovaries, more especially if it be accompanied by nausea or vomiting. Though present in other forms of genital disease in the female, it more frequently occurs in chronic oöphoritis than in any other female complaint with which I am acquainted. Take, for instance, as I have done, 500 consecutive, unselected gynecological cases, and we will find this symptom complained of in 59.6 per cent of all, whereas in the oöphoritis patients it was present in no less than 79.5 per cent—that is, it is about one-third more common here than in the generality of female complaints. Usually persistent, in some cases it is at times intermittent. Thus in 84.9 per cent of those cases where it occurred it was always felt, while in 15.1 per cent there were times when it was entirely absent. It has been presumed that its presence indicated descent of the ovaries; but this is not entirely

true, for in not a few the ovaries were found in about their normal position. Intermittence of dyspareunia indicates descent with mobility of the ovaries. Where fixed low down the pain always occurs, more especially if the ovary be adherent in the bottom of Douglas' cul-de-sac. The degree of pain varies greatly, being most aggravated in those cases where the ovaries are firmly fixed in prolapsus, least where they are mobile; the size of the inflamed ovary seeming to have very little to do with the severity of the dyspareunia. In instances where digital examination revealed extreme sensitiveness to pressure, inquiry elicited the fact that coitus was similarly unbearable, the pain from the two causes being also alike, even where the ovary was movable. The rule is, however, that descended and fixed ovaries are the most intolerant of the impact of the male organ. Sometimes the pain is so severe that coitus is absolutely unbearable and therefore is entirely refrained from. Such cases, however, in my experience, are not very common, comprising only about 4 per cent of all instances of chronic oöphoritis. The degree of pain is indicated in the following, the cases being compared with the dyspareunia occurring in 500 general gynecological cases:

Degree of dyspareunia.	Oöphoritis cases.	All gynecological cases.
Slight	15.6 per cent.	31.8 per cent.
Medium	6.2 "	6.7 "
Great	71.9 "	57.2 "
Intense	6.3 "	4.3 "

In a few patients nausea coexisted with the dyspareunia, and occasionally—though this was rare—there was also vomiting. All such cases were instances of ovarian descent. Desire was usually absent in such cases, to some coitus being absolutely disgusting. In the majority of all cases, however, desire persisted, the pain, unless severe, having very little deterring effect.

5. *Painful Defecation.*—This was present in only a minority of the cases—that is, in only 12.4 per cent—and then almost always depended in great part upon constipation, the ovaries, almost always the left, being descended. However, it occasionally occurs when the ovaries are high up, this being only about one-fourth as common as when the ovary is down. The passing of the hardened masses of feces under and pressing on

a sensitive ovary, resting as it does upon the rectum, is the cause of this. Sometimes the constant aching from which such patients suffer so much seems to be due to an overloaded rectum constantly pressing on the inflamed ovary, for at times such pain is relieved by complete evacuation of the bowels. Occasionally, also, I have seen nausea and vomiting even occur during defecation, but such instances are rare. The pain is generally felt, not in the rectum itself, but over the left ovary anteriorly, and resembles that so characteristic of oöphoritis. In fact, patients usually aver that the spontaneous pelvic pain, the dysmenorrhea, the dyspareunia, and the painful defecation from which they suffer resemble each other closely. The painful defecation varies considerably in degree, being usually slight; but at times it is so great that defecation is dreaded, and may become even so extreme that for days evacuation of the bowels is avoided.

6. *Dysuria* is a symptom so frequently present in women, with or without genital trouble, that its value is slight as an indication of ovarian inflammation. At one time it was claimed by Rigby that its presence pointed to disease of the anterior half of the ovaries, but experience has shown that in no way is this the case. In oöphoritis it is present in the majority of patients, but seems rather to depend upon either coexisting peri-uterine trouble, or even upon a simple irritable state of the bladder itself.

7. *Mammary Pain* is rarely met with in simple cases of the disease under discussion; in fact, when it does occur it is always, to my mind, due to uterine complications. Tait believes it common in oöphoritis, but in this I cannot agree with him. In such cases as it did occur it existed in and about the nipples, was sometimes submammary, most often on the left side, was never very severe, appeared almost always just before or during the menstrual flow, and frequently coexisted with hardening and intumescence of the mammary glands. Such cases always presented uterine disease. As I have frequently observed such symptoms without ovarian disease, and rarely with it, the presumption is that it is dependent upon the uterine affection alone.

8. *Pain at other distant points* is frequently observed, such as migraine, vertex pain, intercostal neuralgias, etc., but is in no way characteristic of chronic oöphoritis. Usually existing in a debilitated constitution, it is caused, not by the ovarian inflammation, but rather by the accompanying anemia, which is so common in these patients. Much has been written of the

ovarian reflexes and the suffering they entail, and in the past they have been used as indications for celiotomy when apparently dependent upon diseases of the appendages; but of all the cases I have met with, in not a single one was suffering so great that operation based on this indication would have been deemed justifiable. I can do no better than give the opinion of C. C. Lee[1] on this point. He believes that we often find a salpingitis, oöphoritis, or cystic or fibrous degeneration of the ovaries in cases of peripheral irritation, but—and I here coincide with him—malconditions of the uterus exert far more influence in these directions than diseases of the appendages. However thoroughly these latter are treated, the neuroses will almost surely persist until the accompanying uterine disease has disappeared. In neurotic conditions removal of the uterine appendages is not only useless, but often leaves the patient worse off than she was before. The appendages should be removed if serious disease of their structure is unquestionable, but not otherwise. Robert Barnes holds about similar views. As my experience corresponds exactly with the foregoing, I have reached like conclusions.

Menstrual Disturbances are not marked in chronic oöphoritis. This is in line with Tait's belief that the tubes and not the ovaries regulate the menstrual flow. Neither menorrhagia, metrorrhagia, nor amenorrhea is in any way characteristic of the disease as met with under ordinary conditions, save only the last, amenorrhea, which, when present in oöphoritis, points to the atrophic form of the disease. When excessive flow does occur it indicates that the uterus or tubes are also diseased; when the flow is scanty it depends almost always upon the condition of general anemia which is so common in these cases, unless atrophic oöphoritis can be shown to be present.

1. *Regularity.*—Irregularity is the exception, regularity the rule. Thus in 67.1 per cent the menses appeared normally as to time, while in only 32.9 per cent did they vary from their usual periodicity of recurrence. Taking 1,000 gynecological cases as they presented themselves, in regular order, 68.9 per cent showed normal menstruation with respect to time. Thus we see that the variation between these two groups of cases is extremely slight, indicating that not the ovarian but the uterine disease influenced the perturbations of this physiological act.

[1] New York Medical Journal, July 5th, 1890.

Frequent recurrence prevailed in 80.4 per cent of the cases of menstrual irregularity in chronic oöphoritis, while in 72.4 per cent this was true of the generality of gynecological cases. Infrequent reappearance of the flow existed in only 19.6 per cent of the cases of ovarian inflammation where irregularity was a symptom; whereas in the 1,000 general cases this manifested itself in fully 27.6 per cent where the like condition prevailed.

2. *Character of the Flow.*—The blood discharged during menstruation in these cases is generally fluid; but where the flow is large or obstructed, clotting is the rule, dependent, not on the ovarian condition, but rather upon the uterine disease present. In 63.9 per cent was the menstrual blood fluid, as against 56.8 per cent in ordinary uterine cases—a slight excess, due to the frequency of uterine complications in oöphoritis cases.

3. *Amount.*—This is extremely variable, but not more so than in the generality of uterine diseases, and bears no direct relation to the extent or severity of the ovarian inflammation. As before stated, the only form of oöphoritis which directly influences the amount of the flow is the atrophic, this being distinguished both by infrequency, or even entire cessation, as well as by diminution in the quantity. But even here the cause is really the uterus, for with the atrophy of the ovaries we have steady diminution in the size of the uterus. I have sometimes thought that the follicular variety of oöphoritis also causes irregularity in the time and amount of the menses; but as this condition, when widespread, ultimately terminates in atrophy, it practically becomes a simple variety, or rather an early stage, of atrophic oöphoritis. A glance at the following table will demonstrate the relations of ovarian inflammation with regard to the foregoing points:

Amount of menstrual blood.	Oöphoritis cases.	All gynecological cases.
Small	28.0 per cent.	16.6 per cent.
Normal	25.8 "	19.3 "
Large	43.2 "	30.3 "
Variable	3.0 "	33.8 "

We thus note to how much greater a degree uterine diseases (for the general gynecological cases were mostly of this kind) influence and disturb the menstrual flow.

4. *Duration.*—As even health is characterized by great variation in this regard, each woman being, as it were, almost a rule unto herself, it is not surprising that a similar state of affairs holds good in oöphoritis. In some patients the flow lasts only a few hours, in others it is almost continuous from month to month, constitutional as well as local conditions greatly influencing the length of the flow. Thus in anemic states the flow was short-timed, whereas where endometritis (either corporeal or villous), areola hyperplasia, subinvolution, and tubal diseases existed, the duration was increased, and often even excessive. The following table exhibits better than words can describe the departures from the normal of the menstrual duration in general gynecological and ovarian cases, and also indicates the fact that between oöphoritis and uterine cases there is comparatively little difference, the only striking variation being the greater lengthening of the time in oöphoritis patients:

Duration of menstruation.	Oöphoritis cases.	All gynecological cases (1,000).	In healthy women (Tilt).
Less than 1 day		0.5 per cent.	0.2 per cent.
1 day	1.8 per cent.	2.7 "	1.0 "
2 days	8.1 "	7.2 "	6.1 "
3 days	21.6 "	19.9 "	26.4 "
4 days	16.2 "	13.9 "	26.6 "
5 days	9.0 "	13.1 "	8.5 "
6 days	9.0 "	8.5 "	3.3 "
7 days	10.8 "	10.5 "	21.9 "
8 days	5.4 "	6.1 "	4.8 "
9 days	3.6 "	1.5 "	
10 days	1.8 "	1.2 "	
11 days	0.9 "	0.1 "	
12 days	0.9 "	0.1 "	1.2 per cent.
13 days		0.1 "	
14 days		0.9 "	
15 days		0.1 "	
Almost continuous	1.8 per cent.	1.0 "	
Irregular	9.0 "	12.6 "	

Nervous Symptoms.—Hysteria, even to a mild degree, is a rather rare manifestation during the course of a chronic oöphoritis. At least such is my experience, though many authorities believe otherwise. Formerly writers almost invariably traced back all hysterical developments to some genital irritation, but at present such is not the general opinion. The almost entire absence of such symptoms in my cases may be explained by the fact that the patients were mostly of a phlegmatic, non-neurotic disposition, in whom "nerves" were a thing almost unknown.

A few were hysterical, but these were generally highly excitable women, in whom such manifestations were common. Tilt is of those who believe hysteria frequent in oöphoritis. Skene holds a like opinion. Olshausen entertains a contrary belief. Only a very few of my cases were hysterical, and even then to a mild degree only. Epilepsy or mania I have never met with as the result of oöphoritis, but that such do occur there is little doubt; but what the connection between the two is has not yet been determined. Occasionally a patient would be somewhat depressed and gloomy; a few complained of flashes of heat and cold, some of irritability and restlessness, and some were excitable. But these slight nourotic manifestations were about all that my cases presented.

Miscellaneous Symptoms.—A sinking, sickening sensation over the stomach was common, sometimes amounting to a feeling of absolute disgust. This occasionally increased to nausea, and in a few cases there was even vomiting, though this latter seemed always due to the action of some special cause. For instance, in one case tamponing the vagina induced it; in another it invariably followed coitus; in still another the act of defecation originated it. As will be seen, the inducing cause was always some form of pressure, and in these cases the ovary was invariably found descended into Douglas' cul-de-sac. Nausea, however, was quite frequent even without any special exciting cause, but sometimes it also arose as the result of some new activity, as coitus, pressure by the examining finger, the act of menstruation, etc.

The rule in these cases of oöphoritis is anemia, more or less marked, though sometimes the patients seem, barring their local trouble, to be in robust health. Skin eruptions are occasionally seen, such as herpes and urticaria. Thus Frank[1] records a case of generalized urticaria appearing at each menstrual period, in which there were thickening of the left tube and some enlargement of the corresponding ovary. These were removed and the urticaria disappeared.

Diagnosis.—A positive diagnosis of chronic oöphoritis can be attained only by palpation. The history of her case which the patient is able to give us but excites our suspicions; the grasping of the diseased glands between the examining fingers alone can make our suspicions a certainty. It is not always possible to

[1] Deutsche med. Zeitung, June 23d, 1890.

feel a healthy ovary. If the conditions are favorable, such as a yielding, thin-walled abdomen, a willing patient, it can usually be done; but if the abdomen be loaded with fat, the walls tense, the patient sensitive to pressure or in fear of pain, and if she oppose our every effort, it cannot be done. These facts hold with especial force when there is pelvic disease wherein pressure excites pain. In such cases an anesthetic is needed to render an examination possible. The normal ovary is, as a rule, but slightly sensitive, though occasionally, about the time of menstruation or in nervous females, pressure will elicit a sharp cry of suffering. Olshausen, Skene, Peaslee, and Chaignot agree on this point, and such is my experience after the examination of about 6,000 females. For me the mere fact that an ovary can be grasped between the examining fingers and pain elicited is presumptive evidence that the organ is diseased. Under ordinary healthy conditions its mobility is such that it is no sooner felt than immediately it slips away: like the Irishman and the flea, you put your finger on it and it isn't there. When enlarged or adherent or descended it can generally be easily grasped; when healthy its grasping and holding is a task difficult of accomplishment. Disease always limits its mobility. Normally the ovaries are placed on each side of the uterus, but their exact position is still a matter of doubt. Probably, being such extremely movable organs, whose attachments are also movable, they, like the uterus, have no absolute, fixed position. For practical purposes we may say that they are placed on about a level with the inlet of the true pelvis, the left one resting on the rectum, the right one surrounded by coils of the small intestine, with their long axes nearly parallel with the lateral walls of the pelvis, which they almost touch. About this latter point there is considerable diversity of opinion. Thus, His holds that in the adult virgin the ovary hangs with its long diameter almost vertical. According to Hasse the long axis of both ovaries runs outward and forward, forming with the transverse axis of the uterus an angle open to the front. Schultze figures the ovary with its long axis at right angles to the transverse axis of the pelvis. Each ovary is about 2 centimetres from the corresponding horn of the uterus, being connected therewith by the ovarian ligament. This latter, however, varies considerably in length, being sometimes even as long as 2 inches, at others only half an inch; the right being the longer in about three-fourths of the cases

(Peaslee). In shape they may be described as a flattened ovoid or almond-shaped, though differing considerably in different individuals; for they may be elongated, spindle-shaped, or even almost spherical. In size they are also variable, though generally equalling that of an almond; the right ovary, however, being usually the larger. Puech found in girls of 13 to 14 years the average measurements to be: right ovary, length 29.6 millimetres, height 15, thickness 10; left ovary, length 25, height 14, thickness 9.3. Hennig, who has carefully examined this question, gives the following table, which expresses clearly the whole subject in brief:

	Virgin.	Unchaste.	Married.	Multipara.	Puerperal.	Menopause.
Length of ovary.—Right.....	3.8	3.4	3.0	2.5	4.4	3.1
Left	3.7	3.8	2.8	2.4	5.5	2.5
Breadth of ovary.—Right.....	1.9	1.8	1.7	1.2	1.3	1.5
Left..	1.5	1.7	1.5	1.2	1.4	1.4
Thickness of ovary.—Right	1.0	0.9	1.0	0.8	0.8	0.8
Left.....	1.0	0.9	0.9	1.1	0.9	0.8
Distance from uterus.—Right.....	3.4	4.4	4.7	5.5	8.0	4.0
Left.....	3.3	4.5	4.7	5.0	7.0	3.7

After confinement the ovaries are enlarged, softened, and have a tendency to descend into the iliac fossæ; and in these facts we may find an explanation for their proneness to take on inflammation during the puerperal state. Accessory ovaries are occasionally met with. These, accurately speaking, are not, as a rule, separate glands, but rather separated cotyledons. Winckel, Waldeyer, De Sinéty, and Beigel have described such cases; and in one instance coming under my notice, where menstruation persisted regularly after removal of both ovaries and the tubes, a round, somewhat flattened mass the size of an egg existed low down in Douglas' pouch, having all the characteristics of a chronically inflamed ovary. Where menstruation has persisted following extirpation of both ovaries, the existence of such a separate ovarian formation has been invoked to explain its persistence.

Methods of Palpation for Chronic Oöphoritis. External.—This assists but little in our search, as it can elicit only resistance, tenderness, or pain. It serves simply to direct our attention to

the pelvic organs as the seat of the disease. It is performed by placing the patient on her back, with the thighs drawn up, head and shoulders elevated, the bladder and bowels being previously emptied. Pressure is gradually exerted so as to avoid inducing contraction of the abdominal muscles; or, if possible, the patient's attention is engaged. In spite of all precautions, in some cases the patient will keep her muscles firmly contracted, more especially if tenderness be extreme. In such cases the patient is directed to open her mouth wide and breathe slowly but deeply, when often the muscles will relax. Nevertheless there are not a few instances where it is impossible to overcome this rigidity of the abdominal muscles except by the administration of an anesthetic.

Internal.—The examining finger in this method will fail to reach the ovary unless it is descended. In the latter case its lower portion can usually be felt, pain elicited, absence or presence of mobility determined, and the effect of drawing on the uterus observed. If the ovary be situated high up it is absolutely valueless. It is performed in one of two ways: with the patient either in the ordinary back position or in the left lateral semi-prone, the former method being preferable. Thomas resorts to the Sims position, however, in cases of prolapsed ovaries, and claims excellent results. Practically this method, as a whole, is of very little value.

Intero-external, or conjoined manipulation, is the only method that gives satisfactory results. In employing it certain precautions are necessary. As we are dealing with a sensitive organ, in women who have usually suffered much and who dread the infliction of further pain, it must be gently performed, all rough handling avoided, the pressure being only gradually increased, muscular relaxation brought about, if possible the patient's attention drawn off, and, above all, her confidence obtained. Having shown her that we propose to inflict the minimum amount of pain compatible with such an examination, our chances of success will be so much increased. By it the exact position, size, mobility, shape, and tenderness of the ovaries can be accurately determined and their relations to the various surrounding organs interrogated. Without it no positive diagnosis can be reached. Hence a careful consideration of the various modes of its employment is in order. These are rather numerous, but the most prominent, and the only ones to be recommended, are

the vagino-abdominal and the recto-abdominal, the former in the vast majority of cases being given the preference.

Vagino-abdominal—ordinary method.—The patient being placed in the dorsal decubitus, with flexed thighs and knees widely separated, the index finger or middle and index fingers are carefully introduced into the vagina up to the uterus, the position of which having been accurately mapped out, the examining finger is passed up to the fundus, the cornua located, and then following the tube—which will be felt as a worm-like mass, not unlike the veins in varicocele in the male—across toward the side of the pelvis, the ovary is felt for. Meanwhile the external hand has slowly, and without any sudden or undue force, depressed the lower abdominal walls over the uterus, which being felt, the hand then follows the internal finger along to the side of the pelvis, making deeper and deeper compression backward and downward. If the conditions be favorable and the ovary be in or about its normal position, it can be felt. If healthy it will almost immediately slip away; if diseased it can be grasped and examined at leisure. If not found in the normal position, the internal examining finger is passed into the posterior vaginal cul-de-sac and upward pressure made, first centrally, then laterally on one side, then on the other, while the external hand depresses the abdominal walls more deeply so as to bring the hand behind the uterus, if possible deep down in the pelvis. Unless great care be exercised patients will strenuously resist this maneuvre and our examination be thus rendered somewhat unsatisfactory; though even if the ovary cannot be felt by the external examining hand, it yet serves to further depress and fix the descended ovary and in this way aids our examination. To bring the internal finger nearer to the parts to be investigated, the perineum and vaginal outlet may be invaginated by firm upward compression with the two or three doubled-up external fingers of the examining hand. If the ovaries are not found in Douglas' cul-de-sac or the lateral pouches, we next look for them anteriorly and then laterally on the pelvic walls. In some cases our utmost efforts fail to give satisfactory results, principally on account of the patient's resistance or from thick abdominal walls, and in such an anesthetic must be resorted to to obtain complete relaxation. To get the best results the left hand is given the preference as the active or internal examining one when interrogating the left

ovary, the right when the other is to be examined. As the left ovary is the one most easily reached, on account of its position and relations, it should be the one first examined, even though pain be complained of on the other side; for often both ovaries will be found affected, even though the symptoms are referred all to one side. When this is so the left is most frequently the side complained of. It is necessary to secure complete evacuation of the rectum and bladder before resorting to bimanual palpation.

Schultze's Method.—The important point in this method is the location of the inner border of the contracted psoas magnus where it covers the entrance to the pelvis, this being our guide in looking for the ovaries, which normally are placed alongside the border of these muscles or below it. It is performed with the patient on her back, and in every other respect resembles the ordinary method, save that, instead of using the cornua of the uterus as guides, the psoas muscle is felt for and from this the ovaries located.

The Trimanual Method of Kelly, or examination by forced descensus attempts to bring the ovary within our reach by dragging down and holding the uterus by means of a tenaculum or a pair of bullet forceps. An assistant holds this while the operator proceeds to make bimanual examination according to the usual methods, either per vaginam or per rectum. The advantage claimed for this method is the ease with which the uterus and its adnexa can be reached. An assistant may be dispensed with by using a special tenaculum devised by Kelly for the purpose, which can be grasped between the ball of the thumb and the last phalanges of the third or the third and fourth fingers of the pelvic hand; or, if rectal examination is being made, between the dorsal surface of the third and the palmar surface of the fourth fingers.

Ullmann's Method.—Ullmann [1] has shown by experiments on the cadaver that when the bladder is emptied and a colpeurynter, introduced into the rectum, is distended with six or eight ounces of water, the uterus ascends in an arc extending upward and forward; the left ovary at the same time is raised higher than the right, the uterus being obliquely situated in such a way that the end of the left tube is somewhat higher than that of the right. In the living subject, with the rectum similarly dis-

[1] Centralblatt für Gynäkologie, March 24th, 1888.

tended, the uterus is strongly anteflexed and approximated to the abdominal walls, so that the entire organ with its appendages and the broad ligaments can be accurately mapped out by ordinary bimanual palpation.

Abdomino-rectal Method.—Cherau, Löwenhardt, Tilt, and others place great reliance upon this mode of examination. It is especially useful in cases where, for some reason, vaginal exploration is impossible or unjustifiable, or where the results thus obtained are not satisfactory. To me it has given excellent results, especially where the ovaries were descended, more particularly when low down in Douglas' pouch; though I must agree with Schultze that it is never as useful as examination by the vagina. The decubitus, etc., of the patient are as in ordinary bimanual palpation, the only difference being in the active finger, which, being gradually insinuated into the rectum, previously thoroughly evacuated, is carried up behind the uterus until the finger reaches the upper third of the pelvis. Kelly speaks highly of this avenue of exploration, and places great reliance upon it in the detection of the minute details of the uterine and ovarian surfaces.

Occasionally we can resort to Simon's method of rectal exploration (Olshausen), and it has been recommended, where possible, to pass the whole hand into the vagina (Thomas). As yet I have found no necessity for resorting to such extreme methods.

The signs elicited by the foregoing modes of examination in chronic oöphoritis are: 1, altered position; 2, curtailed mobility; 3, changed shape; 4, increased or diminished size; 5, presence of tenderness.

1. Unless the ovary has been caught and fixed by a previous peri-oöphoritis, it is always and invariably more or less displaced in chronic ovarian inflammation. Generally downward and toward the median line, it may be displaced forward or even laterally—never upward, in my experience. As it enlarges, its weight being naturally increased, it has a tendency to sag downward. This displacement may be slight, but it always occurs, so that on searching for it and finding it below its normal level, when free, it is presumptive evidence that it is diseased; the mere fact of finding an ovary normally placed when freely movable being indicative of a healthy condition of the organ. In its new position it may and frequently does become fixed by secondary peritonitis, more especially if it has descended into

Douglas' pouch or rests against the lateral posterior wall of the uterus.

2. The healthy ovary, as has been pointed out, is extremely movable, so that the holding of it between the examining fingers is almost impossible of accomplishment. Chronic oöphoritis renders it much less mobile, so that it can be easily grasped, and this independent of any adhesions. Thus it can be held and its every detail determined. This is especially true when almost preserving its normal anatomical relations. When descended it is harder to get at from above, but when once found and grasped its holding is just as easy a task as when placed higher up in the pelvis.

3 and 4. The shape of an ovary is always changed when chronically inflamed. In the majority of cases it is uniformly enlarged, smooth, its transverse axis being the longer, though the greatest actual enlargement, when enlarging more in one direction than in another, is from before backward. It often reaches the size and shape of an English walnut or that of an egg, and in some cases even becomes larger, in a few instances being as large and as round as a small orange. Where perî-oöphoritis exists, or where there is considerable cystic formation, it is irregular in outline, with sharper angles. Later on, especially where peritonitis has preceded the oöphoritis and where the organ has been compressed by the contracting adhesions, it is diminished in size. In the atrophic form, where the lesion is in great part confined to the follicles, more especially in that variety following the infectious diseases, the ovary is greatly diminished in size, the lesion being a destructive one; in fact, in some cases the ovary is so small that it cannot be detected.

5. Sensitiveness to pressure is always present; sometimes the pain thus caused is excruciating. Never absent, it varies much in degree. Often I have seen patients flinch at the slightest touch of the vaginal finger, especially where the ovary was descended; but in other cases I have been surprised to note the comparatively slight reaction to considerable pressure, even when the ovaries gave other evidence of considerable disease. This is generally true of old cases, recent cases giving usually the greatest evidence of pain. The most sensitive patients were very recent ones or where there was coexisting pelvi-peritonitis. The pain varies at different examinations in the same case, usually being most marked shortly before menstruation. The char-

acter of the pain also varies. It has been said to resemble that produced by pressure on the testicle, but it has seemed to me to be without that sinking character so marked in testicular pain. Some described it as sickening, others as sharp and cutting, others as burning, but in all it seemed unbearable, as they instinctively drew away, even though cautioned not to do so. Occasionally pressure evoked a feeling of nausea with tendency to vomit, but this was only in a small minority of the cases. As the normal ovary is but slightly tender, and as sensitiveness to pressure is always present in chronic oöphoritis, this is an extremely important symptom.

(To be continued.)

RESULTS OF ASEPTIC CELIOTOMY.

BY

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THE fact that I have had no death in abdominal and pelvic surgery for nearly two years, though I have operated on many cases and have declined to operate on none where surgery could promise relief, suggests to me that probably some of the previous bad results of my operations were due to an imperfect knowledge of the topographical anatomy of the abdominal and pelvic viscera, or of the pathological conditions for which celiotomy is indicated, or of the best methods of operating and preventing accidents, complications, or sequelæ. Many of the bad results in celiotomy could be prevented were this work done by men thoroughly prepared to give their patients all the protection that surgery offers. No one should attempt to open the abdomen until he is familiar with the anatomy and the normal relations of every abdominal and pelvic structure, and with the pathological conditions that may be encountered, and with the correct technique before and during the operation.

While we cannot make a positive diagnosis of the diseases

for which celiotomy should be performed, we can usually do so with sufficient accuracy to indicate the necessity for an operation; and if we understand the best methods of treating all conditions that may be encountered our results will be good, provided we neglect nothing in the interest of the patient. Of course some operators are more expert than others, but there are very few who do not possess enough mechanical skill to do successful surgery if they become otherwise masters of their specialty.

We are sometimes surprised at the bad results of men who apparently do good surgery, but if we will study the details of their work we will find that something is lacking; and unless the details are attended to in every particular bad results may be expected. I may be taken to task for saying that there are relatively few men who are surgically clean, but I make the assertion because I hear of deaths resulting from sepsis in cases where the poison was carried to the patient by the operator or his assistants, or on something used in the operation, for there was no pus or matter of any character in the structures removed that could have contained pathogenic germs. It may be claimed that sepsis was caused by the germs in the atmosphere; but this is nonsense, unless the operations were done in a room where there had recently been some infectious disease. If atmospheric infection causes sepsis in celiotomy, it is so infrequent as to be practically not worth considering. While I would not operate in a room recently occupied by a patient with an infectious disease, or allow any person at the operation who had been in recent contact with an infectious disease, still I am not positive that it might not be done with impunity if we bring nothing in contact with the peritoneum that has poisonous germs upon it. Infection is almost invariably the result of contact, unless there is some virulent accumulation within the abdomen or pelvis that cannot be removed without soiling the peritoneum. The germs are carried to the patient on the hands of the operator, assistants, or nurses, or by the sponges, water, instruments, ligatures, or other things used in the operation, and no one will have uniformly good results who does not supervise everything connected with the operation; or, if he cannot do this himself, he should have some one do so in whose honesty, fidelity, and ability he has implicit confidence.

In reviewing my early experience I recognize that I did not

observe all the details in such a way as to give the patient the best chances against infection, and I have learned the necessity of knowing personally that everything is correctly done.

I will briefly detail some of the methods observed in my celiotomy work in the gynecological operating room at St. Joseph's Infirmary.

No one assists in the sterilization of gauze, sutures, instruments, dressings, etc., except my assistant, Dr. Frank, who has been practically trained for such work by several years' experience here and abroad; and my head nurse, who assists in nearly all my operations. Especial care is taken after sterilization to prevent reinfection, which may occur if instruments, etc., used in the operation are handled with unclean hands or come in contact with anything unclean. Every one who has anything to do with sterilization or with the operation is required to be bathed and dressed in clean linen, to wear linen gowns that cover nearly the entire body, to have the hands washed with green soap and hot water with sterilized brushes, and afterward washed in a 1:1000 solution of bichloride of mercury. This, if done properly, makes the hands practically sterile, and there is no necessity for putting the hands in solutions of permanganate of potash and oxalic acid, for the bacterial spores, if any are left, will be so embedded in the surface layer of the skin that they cannot, probably, infect anything. The assistants and the nurses are usually inspected, to see if the finger nails have been trimmed and cleansed and if the hands have been correctly sterilized. By taking these precautions, sterilization in Arnold's or any approved sterilizer may be so perfect that a pathogenic culture cannot be made from the instruments, sutures, towels, gauze, etc., used in the operation. This has been tested by Dr. Frank in the bacteriological laboratory at the Kentucky School of Medicine, and I now have but little concern about infecting patients, unless there is a pus tube, or something containing septic matter, that cannot be removed from the pelvis or abdomen without soiling the peritoneum, and of course this will rarely occur in the practice of a successful operator.

The instruments are washed with sapolio with a sterilized brush, and all unclean matter is removed, especially in the openings where the blades are joined and in the eyes of the needles. They are dipped in boiling water, wiped dry, wrapped in a ster-

ilized towel, and put away. The water used in sterilization, in washing instruments, sponges, and during the operation, has been filtered through a Pasteur filter and boiled. The towels are used for no other purpose, and are washed separately from other clothing and boiled in clean water for half an hour. Everything used, except the sponges and kangaroo tendon, is sterilized for an hour, just before the operation, in an Arnold's sterilizer in the operating room, and taken out when needed at the beginning of and during the operation. The silk for ligatures and sutures, three sizes, is loosely wound on glass spools as a convenience during the operation, and is wrapped in gauze with the silkworm gut and the needles. The instruments known to be necessary in the operation are wrapped in one towel, and those that may be necessary in the treatment of any condition that may be encountered are wrapped in another, to be held in reserve, so that no imperfect preparation shall delay the operation.

Sponges are used, but gauze, or absorbent cotton wrapped in gauze, may be made sterile; and, unless the operator supervises the preparation of his sponges, the latter may be preferable. The sponges are carefully selected, well shaped, of soft texture, as free as possible from calcareous matter or dirt. They are thoroughly beaten with a wooden mallet on a hard, smooth surface, after which they are carefully washed in cold water and put for twelve hours in water made disagreeably sour with hydrochloric acid. The acid is washed out of them, and they are kept for six hours in a mixture of sulphurous acid one part and water five parts, when they are again washed and put in a large glass-stoppered, sterilized jar or bottle filled with alcohol. They are now aseptic, and will remain so indefinitely if not reinfected by carelessness in removing them from the alcohol.

As it is impossible to know in just what cases irrigation or drainage may be necessary, glass irrigation and drainage tubes, gum dam and tubing, and everything used for such purposes are put in the sterilizer.

The operating room is well ventilated and the floor and walls are kept clean, and some hours before the operation the dust is wiped off of everything in the room with a damp towel. The spray is not used, because it is of no practical value, and if the atmosphere in the room is surcharged with an irritating germicide it might act injuriously upon the peritoneum or the kidneys. It is well to have the atmosphere in the room moist, but this is

accomplished by the sterilization that is continued during the operation.

No patient is operated upon until the urine has been analyzed for albumin, casts, and sugar. I do not operate on patients markedly diabetic, unless the disease for which the operation is indicated would otherwise prove rapidly fatal. Albumin in the urine is not a contra-indication, because it is often caused by pressure, and when this is removed there is no further trouble. And frequently casts are produced by the same cause; but if they are abundant, indicating extensive nephritis, the operation is delayed, unless there is an immediate necessity for it or unless it offers the only hope of recovery. I recently insisted upon the removal of a large ovarian cyst in a feeble old woman with thirty-three per cent of albumin by volume in the urine, and casts abundant, because she could not live long without an operation and was entitled to the benefit of it. Ether is not given where there is nephritis.

Nourishing, but mostly liquid, diet is given for two days before the operation, but nothing for several hours before it. The patient is well purged, so as to remove fecal matter and gas that would otherwise distend the bowels and interfere with the operation and with the after-treatment. The operation is usually done at 3 o'clock P.M., and the last purgative is ordered the night preceding, so that it may cease to act some hours before the anesthesia is given. An opiate is seldom given, but where the inhibitory powers are weak a hypodermic injection of thirty minims of tincture of digitalis and one-fifteenth of a grain of sulphate of strychnia is given just before the operation. A hot bath with green soap and brush is given by the nurse the evening before the operation, and another at 11 o'clock the next day, and at each bath the vagina is irrigated, and, if preparing for a hysterectomy, a bichloride solution 1:4000 is used. After the second bath the patient is dressed in clean linen, put to bed, and the abdomen covered with a towel wet in a 1:1000 bichloride solution. Thirty minutes before the operation the abdomen and pubes are shaved and again washed, then bathed in ether or alcohol, and the bichloride applied. This is repeated after the patient is on the operating table. This removes all the pathogenic bacteria from the skin that could infect the hands, sponges, or instruments, and does away with the necessity of covering the sides of the abdomen with sterilized towels or gauze. The

patient is put on a plate-glass-top table with a Kelly's ovariotomy pad adjusted, and the limbs and body, except the abdomen, wrapped in clean blankets or sheets, which are covered with sterilized towels so that nothing unclean will be touched.

In preparing for a hysterectomy, after irrigation as above, the walls of the vagina and the neck of the womb are washed with soap and water with gauze or absorbent cotton, bathed well with a 1:2000 bichloride solution, wiped dry, and packed with iodoform gauze. This is repeated just before the operation.

In vaginal hysterectomy for carcinoma the uterus is curetted a few days before the operation and all necrosed tissue removed, and, after careful sterilization, its cavity and the vagina tamponed with iodoform gauze. After the patient is on the operating table the curetting is repeated and the vagina again sterilized, for death may otherwise occur from septic infection caused by the germs in the diseased tissue of the uterus.

All the furniture in the room is free of carving, with no irregularities to catch dirt, and has the highest cabinet finish, so that it may be easily kept clean, as may also the glass-top operating table and the marble and plate-glass tops of the tables for the operator and the nurse.

The vessels for boiling and holding water, and the pans for the operating room, are metal, white porcelain lined, and are used for no other purpose, so that they are free of infectious matter.

Just before the abdominal incision is made the hands of the operator, his assistants, and the nurses are bathed in the bichloride solution, which is immediately washed off in hot water. No germicide solutions are used upon anything that comes in contact with the cut surface of the abdomen or with the peritoneum, and they have no place in the operating room other than to aid in sterilization before the operation; for if the technique has been so imperfect that infectious matter is on anything used in the operation the germicide will not sterilize it, and, if brought in contact with the peritoneum, will have a destructive action upon its endothelial layer, which will destroy in a degree its resisting power against the invasion of pathogenic germs, and may also cause extensive adhesions. The truth of this assertion has been proven by the experiments and observations of the most correct workers in this line of investigation, and I am so positive that germicides should not come in contact with the

peritoneum that I do not use gauze for drainage with iodoform, bichloride of mercury, or carbolic acid on it, nor do they afford any additional protection if the gauze has been sterilized by heat.

The hands of the operator and of every one assisting are kept clean by being constantly dipped in hot water. If a sponge touches anything not positively clean, or becomes soiled with pus or matter probably septic, it is immediately thrown away. Plenty of sponges are held in reserve, but not more than from three to six are generally used in an operation, and as few instruments as possible.

The operation is frequently performed without using a hemostatic forceps to control hemorrhage. All the simplicity is introduced consistent with good surgery, for a multiplicity of technique is unnecessary and confusing. The operation is performed as rapidly as possible, but never hurriedly, so as to prevent traumatism of the abdominal and pelvic viscera, which too often causes serious complications or death if the operator is inexperienced or careless. During the last two years I have frequently separated extensive and firm intestinal adhesions without injuring the bowel, and have not ruptured a pus tube, though I have enucleated them in complicated and difficult cases. Hemorrhage has been easily controlled by ligating everything necessary to prevent it, being careful to include the proximal and distal ends of the ovarian artery. A failure in this particular is the most frequent cause of fatal hemorrhage, which should be prevented if ligation is correctly done with a hard twist or plaited silk ligature, relatively small, but strong enough to thoroughly constrict the enclosed tissue, and enough of the pedicle is left to prevent slipping. The pedicle is inspected before closing the abdomen, and the cavity examined by dipping a sponge into the pouch of Douglas to see if there is hemorrhage except oozing; for if these precautions are not observed fatal hemorrhage may occasionally occur. There is especial danger of this accident where extensive adhesions have been separated, or many ligatures applied upon the broad ligaments in hysterectomy, and in varicose veins with thin walls in the pedicle of an ovarian tumor, easily torn if tension has been too great before or after its ligation.

I recently had a rupture of a large vein below the ligature which would have caused death in a little while had not a sepa-

rate ligature been applied; and I have frequently encountered extensive and firm adhesions of the omentum that could not be separated without so lacerating this structure as to necessitate the removal of the greater portion of it, but no untoward symptom has resulted. If the peritoneum has been soiled with anything probably septic, it is thoroughly cleansed by carrying the water through a glass irrigation tube into every part of the pelvis and abdomen; but this is not necessary if the peritoneum has been soiled with nothing but blood, unless there are clots that cannot be otherwise removed.

Drainage is never used unless pus or septic matter has soiled the cavity or there is extensive oozing, and vaginal drainage is not used except in pelvic abscess or hysterectomy for cancer. A very small and light glass tube, open at the bottom, with fine holes upon the sides extending within two inches of its mouth, is used. This is necessary, because while the blood and secretions usually gravitate into the pouch of Douglas or into the deepest part of the pelvis, this is not uniform; for in one instance I could get but little liquid out of the tube until it had been pulled up two inches, and then drew away a pint which had accumulated between the intestines and the abdominal wall. This may be unusual, but as it does occur it is a wise precaution to have the openings in the tube extend nearly to the abdominal wall. I was formerly much opposed to draining with gauze, except in pus cavities where the surrounding walls could not be entirely removed, but recent experience has convinced me that there is nothing that drains so effectively or gives as perfect protection; and if the gauze is correctly sterilized it is less likely to carry infection than the tube, from which the blood and secretions are removed by suction or by the frequent introduction and removal of small strips of gauze. All the liquid in the peritoneal cavity is removed more rapidly and more thoroughly if a large piece of gauze is placed at the lower angle of the wound and down to the bottom of the pelvis; and if drainage is a means of preventing infection it is because of the removal of secretions that would otherwise furnish a medium in which pathogenic bacteria would develop and multiply. I have just discharged a patient in whose case a glass tube was used, but I placed between the tube and the intestines a thick piece of gauze, which remained in the cavity for three days before disturbing it; and while the patient made an uninterrupted re-

covery from a most dangerous condition, I believe she would have died had I depended solely upon the tube.

The only fixed rule that has governed me in closing the abdominal incision is to bring the several layers of the walls together in the manner that best insures union by adhesion and prevents suppuration, otherwise ventral hernia may follow. This is better accomplished by suturing the peritoneum, fascia, and muscles separately with the buried suture, using sterilized kangaroo tendon, catgut, or silk; but suppuration will then occur unless the divided tissues and the adjacent skin are practically aseptic. While it is impossible to make the tissues absolutely aseptic, the few bacterial spores in the wound or skin will not develop into pathogenic germs, because of the resisting powers of the cellular elements, unless the sutures be so tightly drawn as to partially cut off the normal blood and nerve supply. The buried suture has not been used in drainage cases, but the incision has been united with an interrupted silk or silkworm-gut suture so introduced as to best approximate the edges of the fascia. Sometimes the incision is entirely united with the buried suture by the continuous or the cobbler's stitch; again by interrupted sutures through the entire walls, but, before tying them, separately suturing the peritoneum and fascia, or separately suturing the peritoneum and fascia and then closing the open wound by superficial interrupted sutures.

If the sutures are all buried the wound is dressed with iodoform-collodion, otherwise with iodoform, and many thicknesses of gauze held tightly by a flannel binder so fastened by straps around the legs as to prevent slipping. If no drainage is used the dressing is not disturbed for six or seven days, and then the surface is cleansed and the interrupted sutures removed. In drainage cases the dressings are removed and replaced when soiled, and always removed and the wound redressed when the tube or gauze is taken out. In these cases I introduce one or two provisional sutures to be tied, and close the opening when the tube or gauze is removed.

A FIBROID TUMOR COMPLICATING DELIVERY.

BY

T. J. CROFFORD, M.D.,
Memphis, Tenn.

(With two illustrations.)

On December 6th last, at her home in Arkansas, one hundred miles away, I saw Mrs. P., aged 30, married four years, no children. She was now six months pregnant; had been in labor six days, but the uterus could not empty itself on account of a tumor so shaped as not only to block up the pelvis below the uterus, but so grown in and around the cervix as to prevent its dilatation.

The pregnant uterus was exceedingly high up and to the left of the median line, the tumor was lower down and occupied mainly the right side of the abdomen, but no line of demarcation could be made out between the two. The abdomen, however, presented a nodular feel. No one would have been impressed with the idea of pregnancy but for the subjective symptoms and the condition of the breasts. Nor by the aid of these could a positive diagnosis be ventured, yet the opinion was that, whatever else existed, pregnancy also existed. The possibility of a bifid uterus in which a double pregnancy had taken place suggested itself. The possibility of a simultaneous intra- and extra-uterine pregnancy was also considered. The likelihood of there being a fibroid condition of the womb, with an attempt to deliver a submucous polyp, was not overlooked. Notwithstanding I have myself removed a nodulated, adherent polycystic ovarian tumor with a feel very like this case, and, owing to the presence of peritonitis, pains not unlike those in the case before us were present, yet the impression was that pregnancy was complicated, and delivery interfered with, by an ovarian cystoma. The vaginal portion of the tumor, shown in Fig. 1, was supposed to be a lobule of the cyst. The va-

gina being lengthened by a partial lifting of the tumor out of the pelvis, this lobule could not be so plainly felt at this time. It was with the greatest difficulty that the cervix could be reached.

The consensus of opinion among the physicians present was

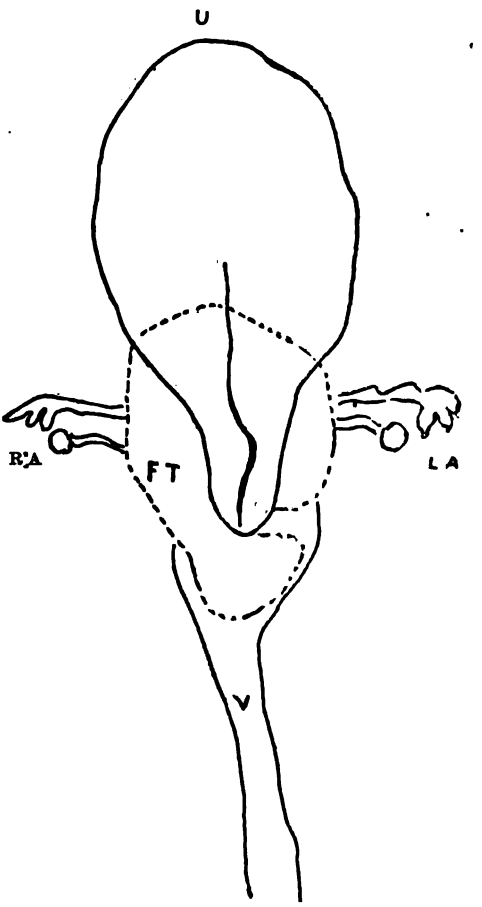


FIG. 1.—U, uterus containing fetus; L A and R A, left and right appendages; F T, fibroid tumor encircling the neck of the womb and mechanically blocking up the same below; V, vagina on the stretch.

that a Cesarean section supplemented by a Porro was imperative, she having already been in labor six days. Owing to the unwholesome surroundings, the want of proper assistance and a nurse of sufficient training with whom to leave so important

a case, I shrank from so formidable an operation here. She was at once removed to my private sanitarium, one hundred miles away. Memphis was reached by rail at midnight, with a very much exhausted woman, and 6 o'clock the next morning appointed for the operation. Her suffering continued unabated, and her exhaustion was not to any extent relieved by the few hours of delay from midnight till morning. Morning came. Owing to her exhausted condition it was not believed she could survive a Porro operation. It was therefore thought proper to make a great effort to deliver from below rather than subject so weak a woman to so formidable a procedure. Accordingly the patient was anesthetized, placed upon the operating table, and secured in the lithotomy position. Then, by making considerable pressure upon the vaginal portion of the tumor, it was pushed somewhat aside, and by great traction upon the mouth of the womb this organ was brought downward to some extent. After forcibly dilating it I finally succeeded in introducing a hand and getting hold of one foot of the fetus. By means of traction the child was finally delivered. The Credé method on the part of an assistant, who used both hands, combined with traction from below by myself, finally brought away the whole of the placenta. The patient was rallied, by hypodermics of strychnia and other stimulants, from her exhausted condition. She for a time progressed somewhat favorably, though far from being free from pain. The sepsis continued, however, in spite of daily uterine irrigation. It was, of course, impossible for me to tell the nature of the remaining tumor, which, after it had settled down, filled the whole pelvis and extended half-way up to the umbilicus. The womb, which could be felt to the left, was rapidly undergoing involution. The tumor was not becoming smaller, but simply settling down in the pelvis. The fact of its not reducing in size caused me to still strongly suspect an ovarian growth, notwithstanding the nodulated feel was apparent. No line of demarcation could yet be made out between it and the uterus. At the expiration of two weeks her condition was growing perceptibly worse. On the seventeenth day after delivery abdominal section was made and revealed the condition shown in Fig. 2. It was now evident that the enlargement of the womb must have been chiefly due to a growth of the fundus above the point at which the Fallopian tubes are given off, and that the uterus and tumor sustained the relation

to each other shown in Fig. 2.[1] Upon intra-abdominal examination the tumor was found to be formidably adherent to the surrounding viscera. The increased time required for performing hystero-myomectomy incident to this complication would be fatal to the patient in her weakened condition. Therefore, is speedily as possible, the appendages on each side were removed and the abdomen closed. The patient was put in a warm bed, only twenty minutes being consumed in the operation. Her recovery from the operation was perfectly satisfactory. She did not appear to be weakened by it. Since we

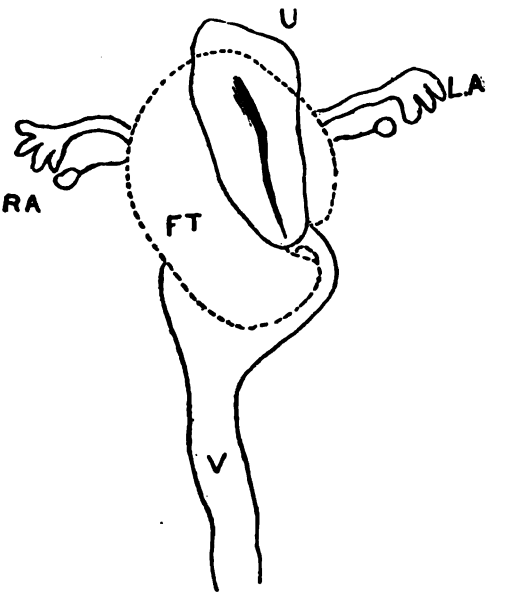


FIG. 2.—U, uterus undergoing involution; L A and R A, left and right appendages; F T, fibroid tumor; V, vagina.

could not take away the tumor, the object in removing the appendages was to cause an atrophy or shrinkage of the tumor, which will be done, in this variety of growth, in a very large percentage of cases. Uterine irrigations were kept up daily. Six days later the septic symptoms became still more formidable, the temperature going up to 106° and the pulse 145 beats

[1] It will be understood that the lines of differentiation shown in the drawings, between the tumor and the uterus, in reality did not exist. The tumor grew into the walls of and around the entire circumference of the uterus, holding it as in a vise.

per minute. Upon investigation the lower portion of the tumor, as well as the whole interior of the canal, was found to be in a septic and sloughing condition. The patient was again anesthetized and placed upon the table in the lithotomy position. Large sections of the lower portion of the tumor were removed by the scissors and the knife, and the oozing surface cauterized with the thermo-cautery, the whole of the uterine canal thoroughly curetted, irrigated, and packed with sterilized gauze. She did better for three days, when this procedure was required to be repeated. This was done some half-dozen times, till almost the entire fibroid tumor and a portion of the uterus were removed *morcellement* added to the above-named procedure. The patient finally made a complete recovery.

While this case teaches that it is not wise to apply the popular radical measures of the day to all such cases irrespective of the conditions existing, yet the fact of the successful termination of this case should not be looked upon as an evidence of the superiority of the measure adopted over the Porro operation; for there can be no doubt that in this class of cases the Porro, in experienced hands, offers safety beyond the measures here adopted, provided the case be seen before the patient is exhausted. The modern radical measures of dealing with these cases meet with the approval of the advanced element of the profession, because statistics establish the fact that they are the safer. It is well known that emergency operations make up a large percentage of the death rate following surgical interference. Obstetric operations are no exceptions to the rule. Symphysiotomy, which is lately becoming deservedly popular, would have given no relief here, because the obstacle to delivery was above the plane of the pelvis. Nor could the Cesarean section and Porro be employed with any reasonable hope of safety, on account of the exhausted condition of the woman. Thus we had an emergency case with the time past at which we could choose measures, but were forced to accept the means that we did, as in our opinion the only feasible procedure which could with any reasonable hope of success be adopted in this case at this time. There could be no election. It was the emergency of emergencies.

SYMPHYSIOTOMY.[1]

BY
BYRON STANTON, M.D.,
Cincinnati, O.

SYMPHYSIOTOMY, while not an operation of recent origin, is one of recent adoption. Even yet its literature is limited and the methods of its performance are but little understood. When we recall the great mortality attending the early cases, and the almost complete exemption from danger when performed under antiseptic methods and in appropriate cases where no complications have arisen from too long delay or attempts at extraction, it seems hardly necessary to speak to those who are familiar with modern obstetric work of the importance of a full appreciation of the causes which have led to so great a reduction of the mortality, and of a thorough understanding of the technique of an operation that is destined to supplant some of the most serious operations the obstetrician is called upon to perform. It will not only take the place of embryotomy and Cesarean section in many cases, but is applicable to a large class of the cases in which the induction of premature labor has been recommended. It makes, however, a better showing both in regard to infant and maternal mortality. It is easy of performance, is attended with little pain and little danger, but should be done under an anesthetic. The division of the symphysis is painless and free from hemorrhage, as the articular cartilage is very sparingly supplied with nerves and vessels. Nevertheless repair is speedy, consolidation in two to four weeks being the rule, to which no exceptions have been reported.

Experiments on the cadaver by Profs. Pinard, Farabeuf, and Varnier of Paris, Biermer of Breslau, and others, have shown that the gain in the pelvic diameters is in proportion to the amount of separation; that in the normal pelvis, or in one moderately contracted, the gain is striking, while in a pelvis of greater contraction the proportional gain is still greater; and

[1] Read before the Obstetrical Society of Cincinnati, March 16th, 1893.

that this gain is not only in the conjugata vera, but also, and to a greater extent, in the transverse and oblique diameters, at the inlet and the outlet; and that the increase of these latter diameters varies between three-fourths and one-third of the interpubic space, while that of the former is about one-fourth. Morisani says that his experiments show that for each centimetre of pubic separation the sacro-pubic lines (the lines from the promontory to the extremities of the separated pubic bones) are increased two and a half millimetres, so that with six centimetres of separation these lines gain from thirteen to fifteen millimetres in length.

According to most authorities 77 millimetres (3 inches) is the extreme to which the pubic bones should be separated, but Prof. Novi, of Naples, reports one case in which the separation was 81 millimetres ($3\frac{3}{16}$ inches) without injury to the sacro-iliac synchondrosis; and Caruso reports one case in which it was 85 millimetres and one of 90 millimetres ($3\frac{9}{16}$ inches). In the patient of Prof. Michael, of Baltimore, the separation was 74 millimetres ($2\frac{7}{8}$ inches) without injury.

It being an established fact that all of the diameters of the pelvis may be increased by symphysiotomy, and that the result, under due precautions, does not affect consolidation of the pelvis or the subsequent walking powers of the patient, the operation may be regarded as not only justifiable, but its performance becomes a duty of the obstetrician in deformities in which there is contraction of the conjugate to not less than 64 millimetres ($2\frac{1}{2}$ inches). Prof. Morisani places the minimum at 67 millimetres ($2\frac{7}{8}$ inches), but in one of his own cases both mother and child were saved where the conjugata vera was only 63 millimetres, a little less than $2\frac{1}{2}$ inches; and Mancusi reports one in which the diameter was but 60 millimetres ($2\frac{1}{8}$ inches), with safety to both mother and child, but version was required, and the child, a female, weighed but $5\frac{5}{8}$ pounds. Dr. Noble, of Philadelphia, says: "There is a general agreement among surgeons to limit the field of symphysiotomy in flat pelves to cases having at least $2\frac{3}{4}$ inches in the conjugate diameter. I find myself in agreement with this opinion."[1] In exceptional cases the operation may be safely performed when there is greater contraction. In a pelvis of 6.4 centimetres ($2\frac{1}{2}$ inches), with separation of the pubic bones to 77 millimetres, a degree of separation that is safe, the

[1] Medical News, February 18th, 1893.

conjugate is increased to 83 millimetres (3¼ inches). As the biparietal diameter of the fetus at term is reducible 8 to 10 millimetres, and as the possible engagement of the anterior parietal protuberance in the interpubic space may give a further relative gain in the antero-posterior lines, the conditions may permit the safe delivery of a child not above the average size; but there is not much certainty of successful delivery in such cases except when the child is below the average of male children in size and the cranium yielding, or premature labor is induced. In most cases, then, in which the fetus can be delivered after craniotomy without injury to the maternal parts, symphysiotomy would render the delivery of a living child a possibility.

The operation is applicable to sacro-coccygeal deformities, and to normal pelves where there is unusual size of the fetus. It is not applicable to any case in which the capacity of the pelvis may not be so increased by the section as to permit the safe delivery of a viable child. If, therefore, the contraction is so great or the child so large that the addition of 13 to 17 millimetres, which can be gained by the separation of the pubic bones 60 to 70 millimetres, will not permit the safe delivery of the child, the case is not one for section. As stated by Dr. R. P. Harris, of Philadelphia, sacro-iliac ankylosis, obstruction of the pelvis by exostoses or other tumors, or the presence of cancer or other conditions preventing dilatation of the os, contra-indicate the operation.

An important point to success in this operation is that the patient should have the best sanitary surroundings, and these are by no means always easy to secure. The sources of puerperal poisoning are many, their recognition not always possible, and their removal or prevention not always easy of accomplishment. All of the sources of infection before and after delivery must be, as far as possible, removed. The room, bedding, clothing, and person of the patient must be above suspicion in regard to cleanliness; impure hands and unclean instruments must not be the carriers of infection; unnecessary digital explorations should not be permitted; and the operation should not be deferred until shock or exhaustion has increased the dangers of delivery.

Mode of Performing the Operation.—The first step in the operation is freeing the surface of the mons veneris and labia majora of hair, rendering the skin thoroughly aseptic by the methods of preparing the abdominal walls for laparatomy, and disinfecting

the vulva and vagina. The patient may be placed at the side of the bed, with knees drawn up and separated, or the operator make take his place between the extremities of the patient.

In making the section preference is given by Dr. R. P. Harris to the method of Prof. Morisani. According to his directions the incision in the skin is but 2 or 3 centimetres ($1\frac{3}{16}$ inches) long, but for an operator not possessed of a very small hand, or in a fleshy patient, a somewhat longer incision may be required. The length of incision, as generally given, is about 3 inches—more than twice as long as advised by Prof. Morisani. This is, however, unnecessarily long. Dr. Harris says the incision should be $1\frac{1}{2}$ to 2 inches long, "the wound in the skin not reaching the symphysis, as in that event the binder fixing the pelvis presses upon the incised part." Dr. Jewett's case, the first in America, was made with an incision $1\frac{1}{4}$ inches long. Dr. Noble, of Philadelphia, in describing his case, says "the operation was commenced by making an incision 1 inch in length in the median line of the abdomen and terminating at the symphysis pubis."

A female catheter is passed into the urethra, by means of which that organ is pushed back and to one side to avoid injury. Having separated the recti muscles from the pubes, so as to admit the index finger of one hand, it is passed by a boring motion behind the symphysis and under the arch; and, with this as a guide, the knife with which the section is made is passed until its extremity projects under and in front of the symphysis. The knife mostly used is that designed by Galbiati, a sickle-shaped, probe-pointed bistoury with a thick, strong blade; but Dr. Harris has devised one with a shorter curve, "based," as he describes it, "upon fittings obtained from a number of deformed pelves." The ordinary probe-pointed, curved bistoury has been used, but it must be of great strength. This was the instrument successfully used by Tarnier and by Dr. Jewett of Brooklyn; but in the hands of Dr. Hirst of Philadelphia, and Dr. McKennan of Paris, Ill., it failed, and they had to resort to other methods, Dr. McKennan substituting a metacarpal saw. The saw, however, is objectionable, one death having resulted from traumatisms due to that instrument. While the operation may be performed without a complete set of appropriate instruments, it can be more easily, safely, and expeditiously done with them.

After section of the symphysis the wound is covered with iodoform or bichloride gauze, 1:4000, and the delivery effected naturally, or, if necessary, by forceps or version, care being taken that too great separation of the pubic bones does not take place. After the delivery the wound is closed with sterilized ligature, silk, silkworm gut, or catgut, and protected by antiseptic measures, as sublimated cotton, and a tight binder or other means resorted to to secure fixation of the pubic bones. The Esmarch bandage, plaster dressings, or rubber adhesive strips have been used for this purpose. Dr. Hirst recommends the rubber adhesive plaster around the hips and lower abdomen, with a tight binder over these. The sutures may be removed in six days.

Unusual care is necessary after the delivery to see that the placenta is completely removed; that uterine contraction is secured, to prevent the formation of blood clots, so that ptomaine infection from these sources may not occur. The patient should be kept in bed until consolidation is complete. She should have frequent vaginal douches of mercuric bichloride, a solution of 1:2000 being recommended at first, and one of 1:4000 later. My own preference would be for weaker solutions. The external parts should be kept clean by frequent ablutions.

In a letter recently received from Dr. R. P. Harris he says: "There have been thirteen operations in the United States in five and a half months—viz., in New York, five; Philadelphia, four; Brooklyn, one; Pittsburg, one; Baltimore, one; Paris, Ill., one. Only one death under the last eighty-six operations was due directly to traumatism, a saw setting up sepsis ending in general peritonitis, with death in eight days. Four other deaths were due to puerperal conditions—viz., shock and exhaustion, two; heart disease, one; rupture of uterus, one. With proper care and a favorable case there should be no death other than will occasionally occur in a parturient woman."

A NEW HYSTERECTOMY STAFF.

BY

I. S. STONE, M.D.,
Washington, D. C.

THE operation known as "complete supravaginal hysterectomy" has come to stay. It may require a few minutes longer

for its completion than other methods, but better drainage is secured, with less pain resulting, and without added danger. The writer has performed seven complete supravaginal hysterectomies and two by the method of Goffe or Baer. In most of these operations no guide was used. In one or two of my earlier cases a colleague assisted by raising the cervix from the vaginal side with the index finger. The others, for the most part, were completed by raising the stump with lion-tooth forceps and cutting down upon the cervix until the vagina was reached. It has occurred to the writer that any staff such as Eastman's might permit more latitude of movement than would be desired, thus endangering the ureters, bowel, or bladder; therefore I have designed an instrument with a cup like that of a Babcock's uterine supporter, with a stem, which serves the purpose of elevator and guide also. The stem enters the cervix one and a half inches and gives positive information of its length. This is especially desirable in Baer's operation. The cup serves as a useful help in extirpating the cervix, as one can cut down upon it without fear of injuring the ureters. An assistant introduces the left index finger into the patient's vagina, which serves as a guide in introducing the stem into the cervix, and in elevating the instrument and stump as high as may be desired by the surgeon. The last hysterectomy performed with the aid of this instrument was completed in forty-five minutes.

CORRESPONDENCE.

INTERNAL MIGRATION OF THE OVUM.

To the Editor of The American Journal of Obstetrics, etc.

Sir:—In an article on "Internal Migration of the Ovum," by Dr. H. C. Coe, in the June number of The American Journal of Obstetrics, I find the following reference to a case which I reported at a meeting of the British Gynecological Society in April, 1892:

"Taylor's case of supposed repeated pregnancy in the same tube, each time with rupture, is open to considerable doubt, since there was no positive anatomical evidence of the first pregnancy, though the history pointed to it."

For the sake of those who may be interested in the subject

of repeated pregnancy occurring in the same Fallopian tube, it is necessary for me to point out that the specimen removed from this case shows the clearest possible anatomical evidence of an old rupture of the tube surrounded by adhesions, external to (and completely isolated from) a recent rupture of the tube from which (recent) placental tissue and clot are protruding.

As tubal pregnancy, so far as I know, is the only possible cause of tubal rupture when no trace of inflammatory distention can be found, the evidence of a prior tubal pregnancy is but little less clear than that of the recent ruptured pregnancy for which the operation was performed.

Corresponding to the first ectopic gestation and rupture there was a clinical history of five weeks' pregnancy followed by sudden pain and collapse, and by the development of an hematocele which was slowly absorbed after many weeks of careful observation. But, as I pointed out at the time, my reading of the case does not depend on the clinical history only. This is checked by the pathological anatomy of the Fallopian tube removed.

We have ocular demonstration of two ruptures of the tube—one recent and one remote—and there can be no reasonable doubt that we have valid evidence of two pregnancies causing the ruptures.

I am, sir, Your obedient servant,

JOHN W. TAYLOR.

59 BATH STREET, BIRMINGHAM,
July 26th, 1893.

TRANSACTIONS OF THE SIXTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.[1]

HELD IN DETROIT, MICH., JUNE 1ST, 2D, AND 3D, 1893.

(*Abstract.*)

The President, LEWIS S. MCMURTRY, M.D., *of Louisville, in the Chair.*

DR. GEORGE S. PECK, of Youngstown, Ohio, read a paper entitled

EXTRA-UTERINE PREGNANCY, WITH REPORT OF CASES.

I have operated five times within the past eighteen months

[1] Concluded from p. 295, August number.

for this condition, with four recoveries and one death. The first case I saw at 3 A.M., August 2d, 1891, finding a very painful, pulsating mass in the left pelvis, with right tubal and ovarian enlargement and adhesions. Patient had severe colicky pains in the left iliac region, and I diagnosticated ruptured extra-uterine pregnancy and advised operation. This was refused, and the next day abdominal section was made, when the cavity was found filled with loose, clotted blood, the left tube having been ruptured. I removed both appendages, and the woman made an uninterrupted recovery.

CASE II.—Was seized, May 17th, 1892, with colicky pain in the left iliac region. From April 29th to June 16th she had discharge from the vagina, together with nausea and colicky pains, at frequent intervals. There was a large, boggy mass in the region of the left tube and ovary. The uterus was crowded to the right, but not enlarged. Diagnosis, unruptured extra-uterine pregnancy. June 17th abdominal section with irrigation and drainage, and uninterrupted recovery.

CASE III.—Commenced flooding December 13th, 1892, and continued until the 16th, when the discharge ceased. December 24th was suddenly seized with severe pain in the right iliac region, accompanied with vomiting. She ran to the neighbors for help, and upon her return fainted. The abdomen was exquisitely tender in the region of the right ovary, but no previous history could be obtained. At 8 P.M. she was still pulseless and still suffering severe pain. At 10 P.M. patient reacted under half-hour doses, hypodermically, of strychnine, one-twenty-fifth of a grain. At 8 o'clock P.M., thirty-one hours after first rupture, the abdomen was opened and the cavity found to contain three pints of loose, clotted blood. I rapidly cut the right tube and ovary, leaving the left appendages and the left side *in situ*. Cavity was thoroughly irrigated and drained, and recovery was uninterrupted.

CASE IV.—Was seized with severe pain in the right iliac region January 21st, 1893. She had slight vaginal discharge, and the abdomen was tympanitic and extremely sensitive. The uterus was enlarged, the cervix soft, and there was a mass in the broad ligaments. Operation was repeatedly advised, but declined. This condition continued, with better and worse intervals, until operation was made, February 21st, at 9 P.M., while she was in almost a complete state of collapse. The abdominal cavity contained about a quart of fluid and clotted blood. A two months' fetus was washed out during the irrigation. Hemorrhages considerable. I packed the right pelvis with iodoform gauze and closed the incision. Gave one-twenty-fifth of a grain of strychnine and one-one-hundredth of a grain of nitroglycerin hypodermically every hour during the night. February 23d injected a saline solution in the cellular tissue of the thigh, and continued tincture of digitalis hypodermically

every hour. March 22d patient had made a good recovery, and left the hospital March 29th.

Case V.—March 2d, 1893, was suddenly seized with severe colicky pain in the left iliac region, accompanied with nausea and vomiting. I visited her March 3d; found her in bed with both knees flexed, suffering great pain, with tympanitic abdomen. Found a tender and boggy mass over the region of the ovary and tube, and offered a diagnosis of ruptured tubal pregnancy and advised operation. Consent delayed. Gave strychnine, digitalis, and ergotin every half-hour hypodermically. I operated sixteen hours after the first rupture, when the pulse was 140 and the woman in collapse. Abdominal cavity contained two and a half to three quarts of loose, clotted blood. The cavity was irrigated and drained. Notwithstanding the frequent use of large doses of strychnine, digitalis, and whiskey, taken in saline solution during the operation, the patient died on the table.

These cases were offered as an example of the conditions that confront operators in dealing with extra-uterine pregnancy.

Dr. James F. W. Ross, of Toronto.—There is no simpler operation in the range of abdominal surgery than that for the removal of an ectopic gestation that has ruptured in the early months. A novice in the operation is much alarmed owing to the large amount of blood in the abdomen. If he will remember one cardinal point, that he is going into the abdomen to tie a bleeding vessel, and that it is to be controlled by pressure on the tube near the cornu of the uterus, his hesitancy will at once cease. If I were called to see a supposed case of ruptured ectopic gestation, and had nothing but a pocket case containing three or four pairs of forceps, a lancet, and a piece of absorbent cotton, I should not wait to go home to get my instruments, but insist on operating at once.

Dr. William W. Potter, of Buffalo.—One thought occurs to me in connection with this subject. That is, it is somewhat remarkable that the author of this paper should have seen so many cases and operated on them successfully within so short a period. This one fact points out a lesson which I wish to draw attention to—namely, that it is a common condition. It is the general practitioner in the remote districts who sees these cases first, and it is he who must sound the alarm; and he either should be prepared to operate promptly himself or have some one else do so. They are cases in which there is no time to be lost if they are to be saved. Prompt action has characterized the operator in the cases reported.

Dr. M. Rosenwasser, of Cleveland.—Dr. Potter called attention to the frequency of the cases occurring in Dr. Peck's practice, which is due to the fact that the practitioners in his neighborhood are educated in this subject much earlier than is

generally the case. The condition is much more common than is usually supposed.

Dr. J. Henry Carstens, of Detroit.—It seems to me it is a dangerous thing to leave a foreign substance in the abdominal cavity, as it is liable to cause trouble. In the present state of our knowledge of abdominal surgery it is safer to remove it as soon as we make the diagnosis. I want to congratulate Dr. Peck on the excellent work he has done. The few cases reported as having occurred in a comparatively small town in Ohio show how many cases occur all over the country. We should preach in and out of season the frequent occurrence of extra-uterine pregnancy, and insist on diagnosticating it by the general practitioner.

Dr. Peck (closing the discussion).—When a practitioner is able to put his hand on a pathological mass in the pelvis, it is better to remove it than to leave it there. This advice I always give to my patients. Three other cases were operated on in my city, and one in the city of Warren, fifteen miles distant, which makes nine cases operated on, with one death.

Dr. M. Rosenwasser, of Cleveland, contributed a paper entitled

WHAT ARE THE INDICATIONS FOR ABDOMINAL SECTION IN INTRA-PELVIC HEMORRHAGE?

Sufficient clinical evidence has now accumulated to demonstrate that a differential diagnosis between extra- and intraperitoneal hematocele cannot be made. It is therefore suggested to divide intrapelvic hemorrhage into *free* and *circumscribed*. We control the former by abdominal section. How shall we manage the latter? Ruptured tubal pregnancy has in most cases been found to be the cause of both varieties, hence the tendency of those entertaining advanced views to treat all intrapelvic hemorrhages alike—by section—as the shortest and safest way out of a serious dilemma. The fact that circumscribed pelvic hemorrhage is quite common, and that cases often recover without operation, and that it is quite possible to distinguish and separate cases requiring operation from those likely to get well by rest alone, makes the author doubt the propriety of promiscuously throwing all into one group subject to abdominal section. Only cases giving evidence of infection, or of continued growth of tumor, or of interference with vital functions by pressure, or of secondary rupture are properly subject to operative treatment.

A table of sixteen consecutive cases of circumscribed pelvic hemorrhage is submitted and analyzed to substantiate the views expressed. There was a definite indication for operative treatment in but six cases. Of the remainder, nine recovered by rest and one was operated on at her own urgent request. Her

recovery was uneventful, but she now has a ventral hernia. Guided by his own experience, the writer would advocate *vigilant delay* until the operation is definitely indicated.

The so-called advantages of early section lose all value when operation is unnecessary. First, *as to control of hemorrhage.* Section is uncalled for when hemorrhage has ceased and the mass is shrinking. Final absorption is effected by rest in bed. Secondary rupture is rare, and the danger arising therefrom is offset by the danger incident to unnecessary operation.

Secondly, *as to removal of débris.* As Nature successfully disposes of the débris in at least sixty per cent of these cases, only a minority will require operation in the event of suppuration or of pressure symptoms.

Thirdly, *as to removal of ruptured tube.* The appendages, in cases recovering without operation and in those treated by vaginal incision, are not touched; and even in cases treated by abdominal section they are frequently so buried by adhesions that they are left undisturbed, no harm following.

Fourthly, *as to safe and speedy recovery.* Though the risk of death by operation be but a fraction, the danger of chronic invalidism from ventral hernia, intestinal adhesions, and, rarely, from fecal fistula, ought to be sufficient to deter one from operating for the sake of speedy recovery. The writer offers the following

Conclusions.—1. Intrapelvic hemorrhage may be *free* into the peritoneal cavity, or primarily or secondarily *circumscribed* by true or false membranes.

2. Though nearly always due to ruptured ectopic pregnancy, the same surgical principles underlying the treatment of other similar hemorrhages are applicable in intrapelvic hemorrhage.

3. Such treatment must therefore vary according to the conditions, dependent primarily on the hemorrhage and secondarily on the original cause of the hemorrhage; hence

4. To prevent *free* intrapelvic hemorrhage abdominal section is indicated in all cases of presumably recognized unruptured tubal pregnancy, either as prophylactic or for the purpose of removing pathological conditions not otherwise curable.

5. In all cases of *free* intrapelvic hemorrhage, from whatever cause, early or immediate section is the only safe means of averting a fatal termination.

6. In *circumscribed* intrapelvic hemorrhage section is indicated for removal of increasing blood clots and débris, whether due to recurrent bleeding or continued growth of fetus.

7. In circumscribed intrapelvic hemorrhage section is necessary whenever the symptoms indicate decomposition of the blood clot. Lastly,

8. Section is also indicated whenever the pressure of the circumscribed blood mass produces obstruction of the bowel.

Dr. James F. W. Ross, of Toronto.—By the writings of vari-

ous authors in the last ten years we have been able to gather a great deal of material in connection with this subject. Yesterday we had an admirable paper by Dr. Peck, in which he described the symptoms and in which the diagnosis was made upon the symptoms. His cases were undoubtedly ones of ectopic gestation, and I think, as such, can be distinguished from hemorrhage due to other causes. I will cite one case of hemorrhage outside of ectopic gestation that came under my observation. A young woman was swinging at a picnic at a considerable height from the ground when the swing gave way and she was precipitated violently to the ground. She immediately experienced faintness and had a feeling as though she wanted to evacuate her bowels. She was carried into the woods nearby and attempted to move the bowels, as the desire was present, and she was unable to do so. This case was treated by my father for some length of time. She had symptoms of intestinal obstruction, and there was a mass to be felt in the pelvis. We watched her case for some time, when the temperature began to rise. I punctured through the vagina, introduced the actual cautery, took out a lot of clotted blood and pus, washed her out, kept her as aseptic as possible, and she made a beautiful recovery. She has had one or two children since and has been in perfect health. This case had no symptoms to lead one to suppose that she was suffering from ectopic gestation. Her condition was simply due to traumatism.

Dr. Charles A. L. Reed, of Cincinnati.—One of my early cases in gynecological practice was that of a woman who gave a history of illness for five months immediately following the birth of a child. I found intrapelvic hemorrhage, and by careful study of the history of the case I determined it was one of extraperitoneal hematocele, having its origin probably in the same traumatism incidental to delivery. I waited for disproof, and the tumor increased in size to an extent much greater than it would to-day in my hands. Finally I made an incision through the vault of the vagina and delivered nine pints of clot. This patient made a good recovery. Irrigation was practised very systematically. (Dr. Reed reported another similar case.) The hope of hemostasis in these cases is for the formation of the hemorrhagic infarct. While in this case I withdrew the blood, and with the result that I felt would follow, there was reaccumulation to a degree greater than that which previously occurred, so much so that, five days after, I did what I ought to have done in the first place—I made a ligature of the appendages from within, found the tube and ovary healthy, and, leaving the appendages undisturbed, evacuated the mass through the vault of the vagina, irrigated it carefully, and closed the abdomen entirely. The result was satisfactory.

Dr. George F. Hulbert, of St. Louis.—The general feeling is that the majority of cases are due to ectopic gestation. As

far as this cause is concerned, in the presence of intrapelvic hemorrhage there is only one condition where there is any excuse for delay, and that is rupture into the broad ligament. I have no doubt there are cases where the rupture occurs intraperitoneally and yet the patient may get well. I have no doubt also, in those cases where the rupture is into the broad ligament, that the mechanical conditions presented there are capable of promoting, and do in many instances promote, ultimate and perfect recovery.

Dr. J. Henry Carstens, of Detroit.—We all agree and practise what Dr. Rosenwasser advocates in cases where there is intraperitoneal hemorrhage, where the symptoms subside, and where the patient gets along without any serious further trouble. We let these cases alone. We do not operate on them, for there is no need of it. Then there are cases where the diagnosis of extra-uterine pregnancy is clear, the danger is great, perhaps a second attack, and where we ought to and do operate in a great many cases. Then, again, there are a great number of cases that are doubtful, and we do not know whether it is best to operate or not. These cases are the "stickers," if I may use that term

Dr. John C. Sexton, of Rushville.—The gynecologist does not know, when a mass is thrown out into the abdominal cavity or broad ligament, when it is going to break down and when it is not. The signs may be good or bad. Early exploration and drainage to relieve it would be better practice. I am afraid we have not arrived at that degree of scientific diagnostic acumen when we are able to differentiate the cases into the operative and non-operative—at least, I have not; and the anxiety that any surgeon would feel with the cases of the kind reported on his hands from five weeks to three or four months is certainly very trying. I believe the doctor would have done better if he had operated on every one of his cases.

Dr. X. O. Werder, of Pittsburg.—The doctor in his paper quotes me as saying that I thought the three cases that I reported would have gotten well without operation. I believe they would have gotten well, because the hemorrhage would have ceased at the time the operation was performed. I have seen three cases of extra-uterine pregnancy in which no operation was done, and two of them were not well in six months. I examined one case six months afterward, and she was still suffering from pelvic trouble, and that was the reason why I advocated operation in those cases.

Dr. Rosenwasser (closing the discussion).—To distinguish cases that are operable from the non-operable is not always an easy matter. I am just as radical as any of the members with reference to free hemorrhage. I am willing to operate as early as any one else. I am willing to operate in any case in which I recognize recurrent hemorrhage, and to operate on a case in

which there is suspected extra-uterine pregnancy not yet ruptured, in order to avoid intraperitoneal hemorrhage.

Dr. H. W. Longyear, of Detroit, read a paper entitled

A PLEA FOR BETTER SURGERY IN THE CLOSURE OF THE ABDOMINAL INCISION.

Dr. Charles A. L. Reed, of Cincinnati, followed with a paper on

THE MANAGEMENT OF THE ABDOMINAL INCISION.

He said the occurrence of suppuration during, and of ventral hernia following, convalescence in a certain minor number of cases, point to defective methods in the management of the abdominal incision. These defective methods relate (1) to preparation of the patient; (2) to the execution of the incision; (3) to the method of closure; (4) to the remote or after-treatment of the wound. Defective methods of preparation depend chiefly upon failure to recognize and remove the débris and germ elements from the minute interstices of the integument. Defective methods in making the incision relate chiefly to failure to recognize the linea alba and to make the incision through it. Defective methods of closure relate chiefly to faulty principles of suturing. Defective methods of after-treatment relate chiefly to the application of the tight adhesive strap with pad firmly compressing the incision. The methods recommended were thorough cleansing—the application of, first, oil, next ether, with some strong alkali, cleansing with clear water, followed by the persistent application, for over half an hour preceding the operation, of a strong bichloride solution. The incision should be made carefully in the median line through the linea alba. The method of closure recommended was by interrupted suture of silkworm gut passed from within outward on both sides entirely through the tissues, but so passed that it enters the wall of the peritoneum near the margin, dips deeply into the median tissue, and is brought out near the margin of the integument. By this means all of the structures are brought into immediate apposition with the sutures and tightened. They should be tied, not tightly, and with the knot to one side of the incision. The wound should be dressed with aristol, boracic acid, and a bandage carefully applied. When the sutures are removed a firmly fitting adhesive strip should be applied, which does not exert such pressure as will induce compression of the incision with a consequent tendency to separate the internal margin. The advantages of the interrupted suture, as here suggested, consist, first, in simplicity of application; second, in passage through and anchorage of the muscles; third, apposition of like tissues to like tissues; fourth, painlessness after operation; fifth, minimum possibility of infection.

Dr. James F. W. Ross, of Toronto.—I agree with what Dr. Reed has said as to the necessity of cleanliness in these cases. The prevention of sepsis is one element in securing absence of hernia subsequent to operations on the abdominal wall.

I heard only a part of Dr. Longyear's paper, which I understand is also under discussion, and I may say that I do not agree with him in many of the points advanced, more particularly in regard to the buried suture. I consider just as good results can be obtained by means of the ordinary suture, as ordinarily applied, as can be obtained by the buried suture, and with a great deal less trouble. In my work I have been particularly careful to pick up the fascial ends, as already explained by Dr. Reed, and to bring them closely into approximation. As I remarked a year ago, it has not been positively proven that fascia grows to fascia and muscle to muscle in the scar that is subsequently left. Even if we have a perfect scar we still may have ventral hernia. The sloughing in cases of operation for hysterectomy where the pedicle is outside of the abdominal wall is occasionally accompanied by large ventral herniæ. About two months ago I saw a case which was operated on for ectopic gestation at full term. She had a large, suppurating wound after the operation. I had not seen her for three or four years. She came to me with an enormous ventral hernia, undoubtedly due to the fact that the pedicle was left in the wound exactly as the drainage tube is, and had produced hernia as the drainage tube does.

Dr. George F. Hulbert, of St. Louis.—The point in the union of the abdominal wound, to my mind, simply consists in as natural a restoration of the damage that we have done there as possible. It is simply coaptation of tissue, and if we succeed in getting the proper coaptation of tissue there is only one other condition that can possibly be the cause of ventral hernia in the future, and that is infection. It is true that too frequently we hear the drainage tube being blamed as the cause of ventral hernia. There is not a particle of doubt in my mind that if we blame the drainage tube itself we are mistaken. If we will concede that it is possible for infection to take place where the drainage tube is situated, then we can account for the ventral hernia simply from the standpoint of infection, and the drainage tube of itself is not the cause of the difficulty. Furthermore, even where we have conditions in which we have to leave open abdominal incisions to some extent, many instances may arise during a celiotomy, or at the close of it, in which we have not time to unite the tissue as nicely as we would like to do it. We are hurried. If we keep infection out of the wound we can have granulation without suppuration. The two things that produce ventral hernia are simply want of proper coaptation and infection.

Dr. J. Henry Carstens, of Detroit.—The two papers that have been read dealt with an important subject. It is a plea

for more accurate surgery. It is not the question of doing certain work, but of the technique or perfect manner in which it is done, leaving patients in good condition. Formerly I simply left the skin to be sewn with silk or silkworm gut, until a year ago when Dr. Marcy showed me how to use the buried animal suture. Since then I have used his method with good results. Before that, when I used the buried animal suture and brought it out through the skin, the result would be suppuration.

Dr. George H. Rohé, of Catonsville.—I use kangaroo tendon. Formerly I used silkworm gut, on account of the unreliability of the catgut as purchased in shops. I always had stitch-hole abscesses until I found a method of carefully preparing the catgut myself, then I had better results. But after reading so much of kangaroo tendon I thought I would try it. You may allow it to remain for three or four weeks unabsorbed and strong, while catgut becomes soft and is absorbed in four or five days. If the patient gets up in a week or ten days the union is not strong enough, and the result is you may have ventral hernia if you use catgut. The kangaroo tendon will hold the wound perfectly solid for four weeks or more, and in the meantime Nature makes the wound so strong that there will be no subsequent trouble.

Dr. M. Rosenwasser, of Cleveland.—I have had post-operative hernia in two cases. In the first case the operator removed a cirrhotic ovary. In sewing up the incision (it was about five years ago) he did as Dr. Carstens has outlined on the blackboard—he took particular pains, when he ran his through-and-through stitch, to bring peritoneum against peritoneum. Instead of allowing the edges to lie in apposition, he brought the peritoneal surface together in the wound.

Dr. Henry Howitt, of Guelph, Ont.—Dr. Hulbert has stated that the drainage tube is blamed for a great many cases of hernia following celiotomy. I believe the drainage tube may be used without running any extra risk of hernia following celiotomy. When that stage in the operation has arrived where the drainage tube should be inserted, I merely pass my forefinger into the abdominal cavity and grasp the rectus either on one side or the other, cut down on the point of the forefinger, then take a Sims forceps and dilate the wound sufficiently to introduce another instrument. By adopting this method the wound may be completely closed and dressed aseptically, and the danger from hernia following is reduced to a minimum, because the incision through which the drainage tube passes is too small to permit hernia resulting afterward.

Dr. Oscar S. Armstrong, of Detroit.—I have been in the habit of suturing the peritoneum first, and then using a separate suture to unite the fascia, the fat, and skin. My results have been good. I have made but two celiotomies in which I have used the single suture, because I have been a little afraid of it.

Dr. L. S. McMurtry, of Louisville.—We will all concede that the great desideratum in closing the abdominal incision is to avoid stitch-hole abscesses and ventral hernia; in other words, to have that method adopted which is the cleanest and guarantees prompt healing of the wound without separation of the edges, and that will prevent separation of the muscular layers so as to allow the contained viscera to protrude through the abdominal wall afterward. Let us go over the history of these operations. McDowell had thirteen cases with eight recoveries, and no ventral hernia following. He sewed up the wound with shoemakers' thread. The old operators used silk until recently for closing the abdominal incision. In my own experience ventral herniæ have occurred without any connection whatever as to the kind of suturing that was done, more particularly in connection with large tumors, or those conditions where the abdominal walls are thin and stretched. One of the last cases of ventral hernia I have had was in a woman 72 years of age, for whom I did an ovariotomy last November for a very large ovarian tumor. There was great distention and thinning of the abdominal walls, and I am sure I never had more time and disposition in my life to close the abdominal incision thoroughly and carefully, and I never did it better than in that case. The wound healed kindly, without a drop of secretion, and there was complete and prompt union. She was kept in bed for three weeks until organization was complete, yet in about two weeks afterward she turned up with a ventral hernia.

Dr. Longyear (closing the discussion).—I expected some opposition in regard to the use of the buried suture, and more especially from those who have not used it or given it a fair trial. When we become accustomed to certain methods we do not like to switch off on to anything else.

I was very much pleased with some of the remarks made by Dr. Reed in his paper. The point he makes of doing injury to fat tissue is of great importance. The bruising and rolling up of the fat produces necrosis of the parts, and cannot help but interfere with healing by first intention.

Dr. Reed (closing the discussion).—I deviate more from the beaten path of suturing the abdominal wound than any one present, making the assertion at random. There are complications other than ventral hernia that deserve consideration and induce me to prescribe precautions against their occurrence—namely, mural abscesses and abscesses in the line of incision, stitch-hole and otherwise. The asepticization of the integument is a thing of which we can never be very sure by the employment of the detergent agents to which I have alluded. The application of saponifying material afterward, and the subsequent application for a considerable time of strong antiseptic solutions, make me approximately sure of the condition of the surface.

Dr. John C. Sexton, of Rushville, Ind., read a paper entitled

CENTRAL RUPTURE OF THE PERINEUM: ITS CAUSATION AND PREVENTION.

Dr. Eugene Boise, of Grand Rapids.—I am very glad the essayist took the ground that he did: that we are not to attempt to prevent these ruptures by manipulative interference so much as by the application of forceps. It seems to me that in the class of cases narrated our safety lies almost entirely in the early application of the forceps, by which we can control the direction of the head and the rapidity of the delivery, and direct the application of the uterine force. The doctor spoke of dilating and attempting to draw back the muscles over the advancing head. That may be done with advantage, but all such efforts must be made in the intervals between the pains.

Dr. M. Rosenwasser, of Cleveland.—The paper is an interesting one, and cases of central rupture of the perineum are rare. I have met only one case in twelve hundred and odd obstetrical cases, besides several hundred I have seen in the obstetrical department of Prague University.

Dr. John M. Duff, of Pittsburg.—I agree with Dr. Rosenwasser that these cases are rare, as far as my own observation goes, nevertheless I have seen two cases in which there was delivery through the central perineal fat. One of them was the wife of a Lutheran minister, who did not have any previous operative work performed, and I was called to attend her in her next confinement. I was not apprised of the fact that she had a central ruptured perineum. The other case was in the hands of a friend who sent for me. Before I got there the perineum had ruptured and the child was delivered through the opening.

Dr. Sexton (closing the discussion).—The accident is a rare one, and yet, with our present improved methods of repair of the perineum, it is not such a great one as it has been heretofore. The literature on the subject is extremely meagre.

Dr. X. O. Werder, of Pittsburg, read a paper entitled

A CASE OF MYOMECTOMY WITH EXTRAPERITONEAL TREATMENT OF THE PEDICLE, FOLLOWED BY PREGNANCY AND COMPLICATED BY HEMORRHAGES THROUGH THE ABDOMINAL CICATRIX.

The patient, 29 years old, married about one year, but sterile, had a large peritoneal fibroid of the uterus with short, thick pedicle, which was treated extraperitoneally by elastic ligature. Shortly after returning home, about eight or nine weeks after operation, she became pregnant while there was still a small sinus in the lower angle of the abdominal wound. Pregnancy

progressed favorably until the end of the fourth month, when five hemorrhages took place from the abdominal fistula, which by that time had become considerably larger, due to the expansion of the abdomen. These recurred at irregular intervals, more or less profuse, seven in all, causing considerable anemia. The patient was removed to the Roselia Maternity Hospital a few weeks before her expected confinement, so as to have her under better control. Labor set in three weeks before her expected time, lasting twenty-four hours, when it was terminated by forceps, delivering a living but poorly developed child. Placenta adherent immediately under abdominal fistula from which the bleeding occurred, requiring manual separation. At this place the uterine wall was absent over a considerable space, the placenta having formed adhesions with the abdominal wall itself. Patient made a very good recovery, and when leaving the hospital the abdominal fistulous opening had completely closed. Menses returned once after the operation, at which time there was some bloody discharge through the abdominal fistula. In another almost identical case of fibroid tumor of the uterus in a young unmarried woman, which I removed by the same method, there is a scanty menstrual discharge, during the first and second days of every catamenial period, through a fistulous opening in the abdominal cicatrix not larger than the head of a pin. While in this case the uterine cavity was not opened at the time of operation, there is no doubt that when the slough under the elastic ligature separated it extended into the cavity of the womb. The fistulous opening then became a utero-abdominal sinus, through which menstrual blood escaped and through which the hemorrhages took place, the source of them being undoubtedly the placenta itself.

Pregnancy following any of the conservative operations on the uterus for fibroid is very rare. A. Martin, in a large number of cases of enucleations, recorded only three cases; but subsequent to a partial suprapubic hysterectomy, as the case reported undoubtedly was, it has never occurred, as far as I have been able to learn.

In order to avoid such unpleasant and dangerous complications as experienced in the case reported, enucleation without opening the uterine cavity and without abdominal fixation, as performed by A. Martin, is a more preferable and conservative operation than extraperitoneal treatment, and should be practised in subperitoneal and pedunculated tumors in young women who are desirous and capable of bearing children.

Dr. George F. Hulbert, of St. Louis.—In the treatment of the pedicle in these operations I feel that we never know how much tissue is going to remain on both sides of the ligature. As an illustration showing the extent of tissue that may be destroyed by the ligature upon the internal side, I recall a case of

hysterectomy in which the lower segment of the uterus was left, the usual clamp was applied, and the stump was treated extraperitoneally. It was in a negress 35 years of age. I did not anticipate sequelæ, but about forty-eight hours after the operation, on account of the restlessness of the patient, the dressings became disturbed and it was advisable to reapply them. In removing them I found that my clamp was so loose that I could move it in any direction, and I failed to see the necessity of the clamp remaining there any longer. I removed it. There still remained the two supporting needles. There did not seem to be a great amount of contraction even at the time the stump was dressed. About four or five days afterward the dressings were again changed and the needles removed, and at once the stump disappeared into the abdominal cavity. I anticipated no unpleasant consequences, as everything seemed to be perfectly healthy. About a week afterward she had a fetid vaginal discharge and there were passed through the vagina the remnants of the cervix. In short, the entire cervix had sloughed and had been fortunately cast off and discharged through the vagina.

Dr. Charles A. L. Reed, of Cincinnati.—The paper is but another reason why we ought to treat the pedicle in hysterectomy and myomectomy a little differently from what we have been doing. We heard yesterday of the part which the extraperitoneal way of treating the pedicle plays in the induction of ventral hernia. We all recognize the fact that it is a weakening element to the abdominal wall. An operation that I believe has come to stay is that of total extirpation of the uterus with enucleation of the cervix; and when it has had a fair trial, which has been credited to the operation by the neud, I feel we shall have not only a larger average percentage of recoveries, but recoveries of a much more satisfactory character. The more I see of the operation of complete enucleation, the more frequently I do it and the more I am impressed with its utility, surgical accuracy, and completeness.

Dr. Werder (closing the discussion).—In regard to total extirpation, I am satisfied Dr. Reed would not have done it in the case reported. I am rather partial to total abdominal extirpation since I have treated two cases with good results. I regret there is not more attention given to enucleation as practised by Martin—the conservative method. It is an important method in the case of a young woman who is desirous of becoming pregnant, and we should try all means to preserve her organs, if possible, and that can only be done by the method advocated by Dr. Martin.

Dr. W. P. Manton, of Detroit, read a paper entitled

THE LEGAL QUESTION IN OPERATIONS ON THE INSANE.

The right of insane persons to amelioration from bodily suf-

fering has remained too long unrecognized, and they have been denied relief from conditions which in the sane would demand and be accorded the most skilful and prompt treatment. Abdominal surgery has only recently been attempted in this class of patients, but the results, both physical and mental, have in every instance, in proper cases, justified the procedure. An Eastern Board of Charities having recently denounced this operation as "brutal," "inhuman," and "illegal," the writer was prompted to look up the law bearing upon the question. From a study of the statutes of a number of States he finds that while there is no direct statement in the law concerning operative interference in insane persons, nor any ruling defining the position of the surgeon in such cases, the guardian of an insane person holding the same relation to his ward as the guardian of a minor, and the latter generally acting in the capacity of the parent in matters concerning the ward's person and property, the authority of the guardian to consent to any act or procedure which is intended for the benefit of his ward is indisputable; and that, having the consent of such guardian, or relative who serves in the same capacity, to undertake operative or other treatment, the surgeon, acting as his agent, is relieved of all obligation, and, in the event of the patient's recovery from the mental malady and objecting to the treatment which she had undergone, would undoubtedly be upheld by a court of law as having proceeded in a justifiable and proper manner.

Dr. George H. Rohé, of Catonsville, Md., read a paper entitled

FURTHER OBSERVATIONS ON THE RELATION OF PELVIC DISEASE AND PSYCHICAL DISTURBANCES IN WOMEN.

This paper gave the further history of eighteen cases reported last year of removal of the uterine appendages for disease in insane women. Since the report in last September two additional cases have been operated upon. In both the ovaries were cystic. The results were summarized as follows: Twenty operations, removal of the uterine appendages upon insane women with pelvic disease, with eighteen physical recoveries from the operation with improvement of the general health; two deaths; four absolute mental recoveries and discharge of patients from hospital; three with complete physical and partial mental recovery; seven with decided mental improvement, but not sufficient to justify their discharge from the hospital; three remain in about the same mental condition as before operation, but physical condition decidedly better; one removed from the hospital by friends a few weeks after operation, and placed in another institution, where she is reported to be worse mentally. A case of melancholia with suicidal tendencies was also re-

ported, in which a badly lacerated cervix was repaired, resulting in complete and rapid mental recovery and discharge of the patient.

The medico-legal relations of the operation were touched upon by the writer. The opinion of a prominent attorney was read, in which the ground was taken that an insane patient having lucid intervals could give a valid consent to any operation during said interval, being at that time considered by the law as sane. Judicial decisions were quoted sustaining this view. In cases where an individual is incompetent by reason of mental derangement to give consent to an operation, the consent of the committee or legal guardian appointed by the court would be valid and justify the operation.

Dr. Charles A. L. Reed, of Cincinnati.—Dr. Rohé has again made the Association his debtor by bringing before us this additional contribution to the work which he is doing in original fields. When he presented eighteen cases last year with excellent primary and very satisfactory ultimate results, both mentally and physically, I felt that he had succeeded in establishing a principle for which I have been contending for a number of years. He operates only under the most careful restrictions and with positive indications. A gentleman who has charge of an important asylum and is alive to the importance of this question, on taking charge of his work carefully investigated his patients for the purpose of determining the existence of pelvic disease, and informed me that existing pelvic disease could be demonstrated in a great many cases to an extent that he was afraid to mention for fear of being called a liar.

Dr. John M. Duff, of Pittsburg.—So far as concerns the cure of insanity by operation, mentioned by Dr. Rohé, I will say that it is surprising that in institutions where no attention had been previously paid to diseased conditions of the uterus or its adnexa a very large per cent of the inmates are subjects of disease of this kind. I regret that I have not statistics with me (I have them at home), but I think I am justified in saying that over sixty per cent of the women in our insane asylums are the subjects of some form of uterine disease. It is necessary for us to educate the profession along this line, because a large element of the profession on this subject are governed by prejudice—we cannot say ignorance.

Dr. Eugene Boise, of Grand Rapids.—I wish to add my approval of the valuable paper that has been presented by Dr. Rohé. It is invaluable inasmuch as he is working in the right direction to impress upon not only the people but the profession the necessity for operative interference in cases of mental disturbance. The doctor has related a case of melancholia which was relieved by a simple operation on the cervix. I also have in mind a patient who had been confined in an asylum, suffer-

ing from a severe nervous disturbance, who was absolutely restored to health, both mentally and physically, by a simple trachelorrhaphy.

DR. JOHN J. GREEN, of Pittsburg (by invitation).—I am associated with a staff of medical gentlemen who have control of an insane institution that accommodates one hundred patients, known as the St. Francis Hospital of the city of Pittsburg and I know the feeling of the members of that staff. I am aware also that the progressive measure advocated by Dr. Rohé received its black eye in my State, and I rise to apologize. The profession of Pennsylvania will gladly succumb to any scientific or progressive measure.

DR. C. HENRI LEONARD, of Detroit (by invitation).—In the operation of ovariotomy, outside of the insane, I have taken a more conservative ground than some operators, but in operating upon individuals who are insane and perhaps not of age the physician in charge ought to have absolute authority to conduct the treatment of such cases, exactly the same as a father or mother manages a son.

DR. ROHÉ (closing the discussion).—I am not infrequently asked by members of the profession what were the indications for operation in certain cases; what form of insanity would you operate on, or what form is less likely to be benefited by removal of the uterine appendages? I invariably answer that I never operate for insanity, that I do not know what organ is diseased. If I find an organ diseased and think I can remove it with safety to the patient, I do so. I look upon an insane individual exactly as I would upon a sane person. I observe the same caution. I do not remove organs that are not diseased.

The following officers were elected:

President—Dr. George H. Rohé, of Catonsville, Md.

First Vice-President—Dr. Walter P. Manton, of Detroit, Mich.

Second Vice-President—Dr. George F. Hulbert, of St. Louis, Mo.

Secretary—Dr. William W. Potter, of Buffalo, N. Y.

Treasurer—Dr. X. O. Werder, of Pittsburg, Pa.

It was decided to hold the next meeting in Toronto, Can., at a date to be fixed by the Executive Council.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Stated Meeting, May 25th, 1893.

H. J. Boldt, M.D., *Chairman.*

A CASE OF SYMPHYSIOTOMY.

The Secretary, Dr. J. Clifton Edgar, presented a young Austrian woman on whom he had performed symphysiotomy at her first labor, March 24th, 1893. The conjugate, measured repeatedly by different observers, was estimated to be not more than three inches and a half; but it was thought possible the child could be extracted with the axis-traction forceps, and these were tried, but failed to engage the head. The parents were opposed to a cutting operation, preferring the destruction of the child; but Dr. Edgar refused to gratify their wish and performed symphysiotomy, with the result of saving the child and the mother. There was no difficulty in effecting delivery after podalic version, except some obstruction as the head came through. The incision was made just above the symphysis. The index finger was passed behind the symphysis, and, having only a blunt-pointed bistoury at hand, division was effected with this by cutting from above downward and from behind forward. The urethra had been drawn over to the left side with a catheter. The highest temperature after delivery was 100.8° F. The bandage was left on thirty days, and the patient was then allowed to move about the room. There was fibrous union, still slight motion, though not interfering with the gait.

Dr. Howard A. Kelly, of Baltimore, thought physicians had been too anxious lest there should be non-union at the symphysis and interference with locomotion. As bearing upon this point he might put upon record a case of an unusual nature, as he knew of but one like it occurring in this country, neither of which had been published. The woman was brought to Johns Hopkins, having passed through an exceedingly difficult labor, during which there had been spontaneous separation at the symphysis. Certain complications were present, abscess formed, and sequestra of the pubic bone came away. In spite of all this she recovered; and while her gait had been decidedly waddling,

it was improving, and they expected to get union at the symphysis.

CASE OF UTERINE FIBROID AND TUBAL ABORTION.

Dr. H. T. Hanks presented a uterus with fibroid tumor removed from a woman 45 years of age, who had lost much blood and had become very anemic. Curettement and palliative treatment had failed to stop the bleeding. An interesting fact in the operation was his discovery unexpectedly of the bones of a fetus in the bottom of the pelvis, which all present supposed to be the remains of a former tubal abortion, and subsequent interrogation of the husband brought out the fact that four years before the woman had had all the symptoms of a tubal abortion.

OPERATION FOR TUBAL PREGNANCY IN THE ABSENCE OF OBJECTIVE SYMPTOMS.

Dr. Hanks presented a second specimen, removed from a young married woman who had skipped a period five days, when she began to suffer from all the subjective symptoms of tubal pregnancy. Three days after the first attack of colicky pain with some bleeding, there was a second attack, without the appearance in the discharges or at the cervix of ovum or membranes. Dr. Lusk was asked to see the patient in consultation, and agreed that there was tubal pregnancy and that laparatomy should be performed, although a distinct tumor could not be discovered. Dr. Hanks operated and removed from the tube an ovum, and the woman made a good recovery.

UTERINE FIBROID WITH PEDICLE UNSUSPECTED BEFORE OPERATION.

Dr. Hanks presented a third specimen, a fibroid about the size of two fingers, the interest in the case centring in the fact that while the fibroid was recognized by examination in the utero-vesical space, it was supposed to be solidly connected with the uterus, whereas at the operation it was found attached to that organ by only a small pedicle. Ergot and other treatment had failed to arrest hemorrhage and relieve other symptoms, for which reason the operation was undertaken. Dr. Hanks thought the lesson should be drawn from the case that at the present day a woman should not be allowed to continue suffering from symptoms connected with fibroids of the uterus while we remained in ignorance of the exact condition present, which could be readily cleared up by opening the abdomen, then doing, according to the indications, one of three operations which in the hands of a skilful surgeon were now safe—namely, enucleation of the tumor, removal of the uterine appendages, or hysterectomy.

DISEASED UTERINE APPENDAGES.

Dr. Ralph Waldo presented tubes and ovaries, removed that afternoon, which had caused pain and other symptoms three years, and had presented the objective sign of bogginess at both sides of the uterus, which, with the subjective symptoms, including sterility, had led him to believe the tubes were diseased. The appendages from each side presented a mass which led him to think they were the seat of malignant change, although microscopic examination had not yet been made.

The Chairman thought the specimens looked like tubes the seat of old inflammatory change rather than of malignant disease.

FIBROID WITH CYST IN ITS CENTRE.

Dr. Waldo presented a second specimen, consisting of a uterus with a fibroid, the latter having undergone cystic degeneration in its centre. The diagnosis had lain between fibroid, sarcoma, and disease of the appendages.

HEMATOMA OF THE VULVA.[1]

Dr. Grace Peckham Murray related a case of this condition and exhibited a drawing. The paper also contained a brief survey of the subject, by which it appeared that obstetricians might attend from two to five thousand confinements without meeting with the accident of hematoma of the vulva. The case which she related occurred in a primipara aged 32, who showed prominence of the peripheral venous system, especially of the lower extremities, and during pregnancy was directed to wear elastic stockings. The labor, at term, had been completed without instruments, although, owing to the fact that the perineum had been unyielding and painful, a little chloroform had been used, and there was a slight rupture, not sufficient to call for suture. A few hours later the nurse noticed that a swelling began to form in the left labium, which soon increased to the size of an orange, and was tense and glistening. Dr. Murray saw the patient soon after, and the tumor had already begun to subside, and had nearly disappeared by the fourth day. Many clots were removed from the vagina and vulva. The treatment had been expectant and antiseptic, frequent douching with bichloride solution. The elastic stockings were taken off soon after the tumor had formed, and it was thought that they might have had some influence in its causation. There had been no varicosity of the veins about the vulva beforehand. In treatment some advocated operative, some non-operative, treatment. The author thought one would be guided by the circumstances of the case. In adopting the expectant plan in this instance she had been influenced by

[1] See original article, p. 226, August number.

experience with a case of large pelvic hematocele which had rapidly disappeared. Much care should be taken to keep the parts aseptic. The mortality in the past seemed to have been about twenty-five per cent. It probably had been greater than it should have been, owing to want of asepsis on the part of midwives and others having charge.

URINALYSIS IN GYNECOLOGY.

Dr. Howard A. Kelly, of Baltimore, read a paper on this subject. In his opening remarks he said that some present might think he had given too much attention to the subject of albumin in the urine, but it should be remembered that the rank and file of the profession were still alarmed when they found that the urine contained even a small amount of albumin.

In gynecological practice the kidneys were more important than any organ outside the pelvis, for two reasons: 1. If they were much diseased the patient would be likely not to survive an important operation. 2. Recognizing this fact, the nature of the operation and its duration would be modified accordingly, and other emunctories would be stimulated to do the work of the kidneys temporarily. Further, a definite percentage of cases of kidney disease arose from pressure upon the ureters.

The immediate practical import of renal examination was: 1. That we might refuse to operate where there was advanced renal lesion, thus lessening the mortality list. 2. In less advanced kidney disease one might, by suitable diet, bathing, massage, and purgatives, avoidance of alcoholics, and watchfulness throughout convalescence, save life. He had not observed bad effects from the hypodermic use of morphine in these cases when it was called for. 3. We would be led to operate earlier if the condition were one which was liable, if allowed to go on, to lead to renal complication. 4. We would use chloroform instead of ether, although he had not observed ill effects from ether in these cases. 5. One would be more likely to use drainage, as drainage acted as an extra emunctory. 6. One would avoid subjecting these patients to prolonged examination or operation under ether, or any unnecessary delay.

For reliability, examinations of catheterized specimens of urine alone should be made; or, if a voided specimen showed albumin, the examination should not be considered complete until the catheterized specimen had also been examined. 1. A slight amount of albumin, though persistent in the urine, did not necessarily signify any disease of the kidneys. 2. Nor was the presence of albumin in considerable amount significant in the absence of casts. 3. Albumin was often significant of mild cystic inflammation, as evidenced by a few pus cells. 4. The presence of a few hyaline or small granular casts was not important in the absence of vascular changes and other symptoms

indicative of renal disease. 5. Transient glycosuria was occasionally found and was without significance. 6. Diabetes mellitus contra-indicated abdominal operations. 7. Albumin found in patients with large tumors often disappeared entirely after operation. 8. Albumin was often found in the urine after pelvic and abdominal operations when it did not exist before. 9. When present before the operation it was apt to show increased quantity after, due apparently to mild cystitis excited by concentrated urine passed after operations. 10. Diminished secretion following operation, even as low as 290 cubic centimetres per diem for three or four days, was not unusual, and need cause no alarm as to suppression of urine or of the possibility of having ligated one of the ureters. That was a very practical point, one which had relieved him of a great deal of anxiety. 11. Persistent diminished urinary secretion after operation, associated with elevation of the temperature, the pulse becoming more and more rapid, was not a sign of nephritis, but of sepsis. In such cases fatty degeneration of the kidneys would usually be found post mortem. He was sure that, not knowing this fact, operators had often attributed death to kidney disease when peritonitis was the true cause. The same statement held good with reference to fatty heart. 12. After numerous experiments Heller's test for albumin had been returned to in daily work. 13. Trichloracetic acid had been given up on account of its over-sensitiveness.

It was important in all hospital work to have systematic urinalysis and to keep records in a chart similar to the one shown. Where repeated analysis was resorted to the results were noted in a large ward book and the history put into shape for statistical use. Such records had been made in Johns Hopkins in all cases the past four years, so that their statistical value was great. The conclusions just cited were based on exact records of 200 cases of abdominal operations and on perhaps 600 more where the records were not as complete.

Of the 200 cases of abdominal operations in which a full account had been kept, albumin had been found in the urine before operation in 46, or 23 per cent, and after operation in 66, or 33 per cent. The increase had been due in most instances apparently to concentrated urine exciting cystitis. Casts were found in 10 cases before operation and in 30 after. In 30 instances hyaline casts were found after operation and not before, and in 5 granular casts were noted after and not before operation. The albumin and casts disappeared before the patients left the hospital.

The normal urinary secretion per diem being about 1,500 cubic centimetres, the records showed that in 50 cases of abdominal surgery, not upon the kidneys, the amount secreted on the second day was 516 cubic centimetres, on the third day 556, on the fourth day 518, on the fifth 582, on the sixth 624 cubic centimetres.

The specific gravity was largely increased, and there was a large deposit of amorphous urates. If one did not know this was the rule he would very properly be much alarmed. Briefly stated, the amount secreted the first few days after an operation was about one-third the normal.

In none of the 200 cases had he been prevented from operating by the condition of the kidneys. Therefore pelvic disease was not associated with renal disease in a large percentage of cases.

Out of about 800 cases of abdominal surgery at Johns Hopkins there had been autopsies in 16 in which kidney disease was found; and in addition there were 6 not operated upon, 5 of them being malignant disease with disease of the kidneys. And out of the whole 22, carcinoma or sarcoma existed in 10, or over 45 per cent, thus showing a remarkable relationship between malignant disease and chronic nephritis. In 7 death was due to peritonitis. One died of chronic diffuse nephritis. In one of the fatal cases there was an enormous cystomyoma, both kidneys atrophied and containing abscesses. Thus in 3 cases out of about 800 the operation had better not have been done, because the renal condition found at autopsy was so far advanced as to preclude a successful issue. In a successful case he divided the ureter, mistaking it for a dilated vein, and by his own mistake was given opportunity to do an original operation in uniting the divided ends.

Dr. Noble, of Philadelphia, read a brief paper in continuation of the discussion. It confirmed Dr. Kelly's observations in almost every particular. In his early career he had had three deaths from suppression of urine following operation—a fact which had impressed him with the important relationship between the kidneys and a successful issue of an operation. Albumin was often present before operation—in his experience in about 10 per cent of all cases. It was not often significant. The urine in the female patient should be drawn by catheter, and, if not, the external genitals should be washed before that intended for examination was voided. The pressure of a tumor might cause albumin. Tube casts were not always significant, but when present should receive special consideration. The presence of chronic contracted kidneys was apt to give the surgeon serious trouble, and in such cases albumin was often absent or only occasionally present, and tube casts might be absent. He had operated upon two women whose urine had been examined by a pathologist over two weeks with negative results, yet in both patients there were contracted kidneys, and they died. If repeated examinations showed a small amount of albumin, tube casts, and urine of low specific gravity, the surgeon should be on his guard. The prognosis after operation was better in women having fairly large tumors, especially ovarian cysts. In them

generally the operation was easy, quick, without sepsis, and after removal of the tumor and relief from pressure the patient was apt to secrete even more urine than before.

Dr. Noble had also found the urine considerably decreased after operations, and believed it to be a matter of universal observation. The quantity was ten ounces the first day to nineteen on the fourth day.

Dr. W. H. Porter thought the significance of a urinary analysis could be best understood by bearing in mind that a healthy individual living in a physiological way would secrete about a given quantity of urine with certain ingredients. Any marked deviation would indicate a pathological condition; and he had long believed that so-called Bright's disease was in nearly all instances secondary to trouble elsewhere, more especially to disturbance in the nutritive system, which caused increased and abnormal work to be done by the kidneys. The nutrition of the kidneys was interfered with, and, increased work being added, the renal cells underwent retrograde changes; and instead of getting the normal constituents of the urine, one found by-products—products indicative of incomplete proteid oxidation. He would say that albumin, when it came from the kidneys, was always indicative of pathological changes of renal protoplasm; and while he did not suggest that it meant a fatal issue, yet it should be considered evidence that there was some abnormal process beyond the kidneys, which should be corrected before a more serious state ensued. The more marked degenerative changes were apt to be preceded by secretion of a small quantity of urine of high specific gravity, high color, super-acid, and one should always seek to bring the urine around to its normal quantity and constituents before resorting to an important operation. He had repeatedly seen patients, operated upon when secreting scanty urine of high specific gravity, high color, though without albumin or casts, taken to the autopsy table within twenty-four or forty-eight hours, or showing albumin and casts and serious renal symptoms after the operation. His explanation was that the etherization, which implied absence of oxidation, had caused a retrograde change along the whole line of tissue metamorphosis, and granular change of the kidneys and perhaps of other organs. After relating a case Dr. Porter again impressed the necessity of bringing the nutritive and secretory organs into line before operating.

Dr. Charles Heitzmann said that as he was known to be a fighter he could not be expected to agree with all the previous speakers had said. He was surprised to hear a paper on urinalysis in gynecology which only dealt with albumin and corpuscles in the urine, scarcely mentioning casts, and seeking only to diagnose the condition of the kidneys themselves. One should distinguish between essential albuminuria and albuminuria of kidney disease. With albumin, pus corpuscles, but

especially kidney epithelium, one could be sure there was a certain amount of so-called Bright's disease. His Philadelphia friend had operated on two cases in which there was atrophied kidney, and the patients had died. Was it possible that our microscopic and physical signs could not enable us to make a diagnosis in such cases? Of course the patient would die! A few casts and albumin were not a contra-indication to operating, it was true. Then there were some cases in which but one kidney was diseased. There was a form of kidney disease with little albumin, which was a serious form because it led to cirrhosis of the organ; such cases did not stand ether well.

But while the kidneys were themselves very important organs, and it was desirable to know their condition as far as it could be determined by examination of the urine, yet urinalysis should reveal more of the patient's condition. It should and would reveal the constitutional state. Not only that, but by urinalysis he had often diagnosed such conditions as endometritis, masturbation, tumors of the uterus, sarcoma of the kidney, etc. Among the amusing cases related by the speaker was that of a woman whom a friend out of the city was about to marry, but grew suspicious of her virtue, and by a little diplomacy procured through the chambermaid a specimen of her urine, which Dr. Heitzmann examined, and, diagnosing endometritis, advised him not to marry her. Another related to a specimen of urine from a woman whose husband had lost one arm in the Confederate army. In advising Dr. Kelly to extend his schedule in urinalysis, Dr. Heitzmann expressed fear that Baltimore and Philadelphia were too far away from New York.

The Chairman asked Dr. Kelly a few questions, among them whether the frequency of nephritis in cases of malignant disease might not be explained by the constitutional condition producing the nephritis.

Dr. Kelly made some closing remarks. He had been struck by Dr. Heitzmann's wonderful power of making a diagnosis in the cases related, but what had puzzled him most was how he had been able, by examining the woman's urine, to tell that her husband had only one arm!

A vote of thanks was tendered the gentlemen who had come from distant cities and given the Section the benefit of their experience.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF CINCINNATI.

Meeting of March 16th, 1893.

The President, Wm. H. Taylor, M.D., *in the Chair.*

Dr. Byron Stanton read a paper on

SYMPHYSIOTOMY.[1]

Dr. C. A. L. Reed.—I feel this subject is a little foreign to me, and it is one which has been brought to my attention by Dr. Zinke in a case where I was called in consultation, in which he advised symphysiotomy. That was a case in which the conjugate diameter was perhaps in excess of the minimum limit described in the paper this evening—viz., two and three-fourths inches—and the deformity was an oblique deformity, with the ilium of the left side pressed in under the normal axis of the pelvic outlet and diminishing the transverse diameter without increasing the antero-posterior. The operation suggested by Dr. Zinke was declined, and when urged by myself was again declined, and the woman very foolishly consented to submit to the much more dangerous operation by the traction forceps. I think I make that remark advisedly. Forcible extraction by means of the traction forceps is, to my mind, a procedure much more dangerous than symphysiotomy, particularly when you have a pelvis of this character to deal with. It is not like dealing with a normal pelvis, in which you have normal diameters and a normal axis through which to perform the manipulation. There is always undue pressure, and this pressure was exemplified in this case. I have seen vaginal fistula, from which the patient recovered. The pressure was such as to induce a fistula, although great care was exercised to prevent the catching of a fold in the arch. It is highly gratifying to feel that recent progress has brought an expedient to our hands in these cases which offers better results than have heretofore been achieved. When Hirsch thought that this was the operation of the future, I believe he echoed what will be true. The technique is certainly very similar. I had in my mind a thought that has been somewhat condemned by the statement

[1] See original article, p. 403.

that the only case of death in the United States was one of traumatism resulting from the use of a saw. It has occurred to me that the ideal way to make this operation is simply to take a curved shield and saw, and in this manner the articulation could be quickly severed. I think it very essential for the protection of the underlying viscera that a sheath be placed there. The saw goes through the bone without any resistance. Even a bleached beef bone as hard as flint yielded to the saw as readily and easily as tissue to the knife. The saw I refer to is constructed with a pistol handle, and is a chain saw operated by a motor. The blade is not thicker than the chain saw itself and runs with a tremendous velocity, and has all the advantages of the saw generally. It can be taken apart almost instantly and can be readily cleansed. I have seen the Galbiati knife, and it seems to me I would almost as lief take a pair of edge cutters as that, particularly if I was dealing with a woman advanced in years. However, I think if I was suddenly confronted with the necessity of performing this operation, I could get the symphysis divided, even if I did not have special instruments.

Dr. Edwin Ricketts.—It does seem to me that the saw to which Dr. Reed refers is *the* instrument to use in this operation. It is not very long since I observed the manipulation of this saw, and the shield of which Dr. Reed speaks has since been added. With this saw one is able to cut through the cranium without any danger of injuring the dura; he can go down to the dura with the saw without any danger whatever. The danger of injuring the urethra, spoken of by the essayist, necessitating the introduction of a catheter for the purpose of pushing it to one side, I do not think is to be mentioned in the use of the saw. I cannot see how there is more risk in using the saw than in using the knife; and having seen the saw work so nicely, it came to my mind as the instrument *par excellence* for this procedure. Within ten minutes after incision through the tissue the operation can be completed.

Dr. Wenning.—One objection to the saw, in my opinion, would be that it does not cut as clean as a knife, and, while it might do with bone, it seems to me that for cartilage a knife would be better than a saw. To-day I glanced over an article in which the author stated that with a certain separation there was a dislocation. It requires very close calculation as to the amount of opening needed to know whether the operation is necessary or not. It is very amusing to pick up works on obstetrics of only a year ago and see how this operation was then condemned; but it has now again become prominent, for operations such as this can now be performed with asepsis and antisepsis. This, of course, decreases the mortality rate of this operation as well as of other operations. If symphysiotomy will save the children, it will of course receive better acceptance.

In determining whether it should be adopted or not in a particular case, we should determine the diameters of the pelvis. The great danger is that operators will take up this operation and use it when it should not be performed.

Dr. Gustav Zinke concurred most heartily with what the last speaker had said, in that he believed the prospects were that the operation will be abused. As to the technique of the operation, if one takes the trouble to read carefully Robert P. Harris' description as given at the last meeting of the American Gynecological Society, he will readily understand and regard it a comparatively easy performance. So far as the knife is concerned, he thought it made little difference whether one uses Galbiati's or any other knife or saw, so it accomplishes the end in view. It has been suggested by some that it might be better to divide the symphysis to one or the other side of the cartilage, as osseous union is apt to be more prompt and firm. This is yet to be determined; the results obtained by division of the cartilage have been quite satisfactory. The operation appears to be simple enough, but if not executed under strict aseptic and antiseptic precautions it will prove exceedingly disastrous to the mother. The mortality of infants born under symphysiotomy is much greater than of those delivered under the conservative Cesarean section. This is due principally to the delay in labor caused by insufficient or slow dilatation of the os.

Symphysiotomy has not been confined to cases of contracted pelvis; it is recommended in cases of certain malpositions of the head and when impaction occurs which cannot be relieved. No matter what the cause of the impaction may be, in an otherwise normal pelvis, he believes that conditions may arise which would make symphysiotomy not only justifiable, but any other effort at delivery on the part of the obstetrician an error of judgment. Take, for instance, an impacted head (occipito-posterior), the child still living, the soft parts of the pelvis dry and edematous, the lower segment of the uterus extremely attenuated, and the contraction ring visible; it would be a very dangerous thing to attempt the introduction of the hand with the view of carrying the head above the brim in order to flex the head and change its position (occipito-anterior), or to apply the forceps, and it would be a still greater mistake to perform craniotomy.

The amount of room gained in consequence of the separation of the symphysis varies according to the age of the patient. The older the patient and the fewer children she has had, the less the amount of separation; on the other hand, in young women at the end of term the separation may be very considerable. Experiments upon pelves in cases where death did not follow parturition amount to nothing. Experiments upon the pelves of women who have died either shortly before or after parturition alone can give a correct estimate as to how much room there may be gained by this operation. Of the first forty-one

operations reported by Harris, the minimum amount of separation was about three centimetres, the maximum nine centimetres.

One of the speakers spoke of the difficulty in determining the diameters of the pelvis. He thought that difficulty will be overcome in proportion to the increase of better facilities for the teaching of obstetrics in our medical colleges and hospitals. When pelvimetry is more thoroughly and persistently taught, and students and practitioners are more impressed with the necessity of taking the pelvic measurements of every woman who is placed before them for the purpose of delivery, in whom there is reason, from an ordinary examination, to believe that the capacity of the pelvic cavity is less than normal, the mortality of the new-born will be reduced to a minimum.

In the case mentioned by Dr. Reed, and which the speaker saw before him, all the diameters were curtailed, principally the transverse. The measurements, internal and external, showed considerable diminution in the calibre of the pelvic cavity. He suggested symphysiotomy, and was satisfied a living child might have been delivered under this operation in this case. It was not a case for Cesarean section. Nor was the case upon which he performed successfully Cesarean section about three weeks ago one for hysterotomy *per se*, but certain complications arose which necessitated Cesarean section. Had he resorted to symphysiotomy the child's life surely would have been sacrificed.

The exact sphere or limitation of Cesarean section and symphysiotomy it is difficult to define. Every man must act upon his own judgment in the cases before him. We can no longer say that Cesarean section is justifiable only when contraction of the pelvis exists to a certain degree, and that all in excess of this belongs to symphysiotomy. Other conditions must be taken into consideration. The best time to perform symphysiotomy, in his estimation, would be at the end of the first stage of labor.

Dr. Palmer.—I have been quite well impressed with this operation, and I think it has a very favorable field opened up before it, but I am disposed to think that this field is a limited one. While this operation encroaches upon podalic turning, the use of forceps, and Cesarean section, still I think its application is limited. It is indicated when the pelvic diameter of the brim is from three and one-fourth to two and three-fourths inches, but of course we can never measure the exact size of the head or of the other diameters. It is interesting to estimate how much the pelvis is enlarged by the opening between the pubic bones. As I understand it, the separation of one centimetre (about two-fifths of an inch) amounts to about one-twelfth of an inch increase of the conjugate of the brim. It is possible to safely separate the pubic bones about three inches, and that implies that you can elongate the antero-posterior diameter of the brim

about three-fourths of an inch. You may estimate about one-fourth of an inch enlargement of the true conjugate of the brim to every inch of separation of the pubic bones. I do not think it matters very much just how this operation is done. Some advise dividing the symphysis from below upward and some from above downward. Some have used the curved director and others have used various forms of the Galbiati knife. I saw the case in which Dr. Zinke made the Cesarean section. In this case the cervix was so obstructed by the formation of cicatricial tissue that the finger could not be introduced into the cervical canal, although she had been in labor some hours. It seemed a fair case in which to perform Cesarean section. He had to dilate the os, so as to admit of drainage, before the Cesarean section was made. If symphysiotomy had been made, of course it would have been very difficult to draw the child through the rigid os uteri. I have no doubt you can make an easy division of the symphysis pubis with the saw, but I have my doubts whether the parts will heal as readily as if the section had been made with the knife.

Realizing what is true as to the relative enlargements of the various pelvic diameters by symphysiotomy, it must be apparent that the operation is best indicated in the symmetrically contracted pelvis, the *justo-minor*. It seems to me, moreover, that its range of application might at times call for its use in cases of impaction of the fetal head in occipito-posterior and mento-posterior positions.

Dr. Reamy.—As I understand, my friend Dr. Zinke stated that this operation would have application even in some cases of malposition of the head where there is not deformity of the pelvis. I would like to take issue with that statement, for I can conceive of no such condition. I have never seen a case of impaction of the head that would have been improved by increasing the pelvic diameter. The resistance in these cases is very largely the resistance offered by the uterus, which would be overcome by correcting the position of the head, and therefore I am entirely unable to see how it would be justifiable to increase the woman's danger by inflicting a deformity on the pelvis. If this was the cause the obstetrician should correct the position of the head. If it had been caused by irregular uterine contractions just above the so-called ring of Bandl—and I have seen four cases of this character—to increase the pelvic diameter would do no good, for the delivery could not take place until the resistance was overcome by relaxation of the contraction. If it is a case of occipito-posterior position of the head, all the increase you could obtain in the conjugate diameter would do no good; and even if it would, it would be much easier to simply correct the position. The patient could be put under an anesthetic, and the obstetrician could introduce his finger and correct the position of the child, carrying his hand into the uterus

if necessary. Either or any of these manipulations could be accomplished with much more safety to the woman and the child. The difficulty is not in the least relieved when the symphysis is divided, for that will not correct the position of the head.

It is not necessary, in order to maintain my position, that I should go on and deliver a lecture on obstetrics to gentlemen who know as much about it as I do. It is not necessary to speak of the various malpositions of the head which might exist. If the child be hydrocephalous it had better be delivered dead than alive. The doctor has made the point that craniotomy would increase the dangers to the mother. It would take her, as it were, out of the jaws of death and take every danger from her in ten minutes' time. Instead of inflicting a trauma on the mother you simply open the head of the child. A skilful surgeon could do craniotomy without the slightest damage to the tissues of the mother. You could open the head of the child, under such circumstances, if you had to go in through the malar bone, and inflict no trauma on the mother. There might be circumstances under which I would do craniotomy upon a living child, but that is not in the discussion. Another point: I think the operation should be done after the first stage of labor has closed. This is true if the pelvic deformity be so great that the head cannot descend far enough to cause a dilatation. This is one of the most important factors in arresting the dilatation. Consequent upon this mechanical difficulty, the case would be prepared for Cesarean section or some other treatment. Where the obstruction is not so great as this it would probably be better to let the dilatation go. This is for two reasons. One would be the delivery of the child so much sooner after the traumatism, and the other would be the waiting a little time for this dilatation and assuring the obstetrician that the deformity was such as to demand the operation, for all of us have had cases in which the dilatation was slow. Certainly, considering the difficulties from a mechanical point of view, if the bridged diameter is the conjugate it would not be so well to make the division at any point as in the cartilaginous union, for the simple reason that the object is to increase the conjugate diameter, and the separation of the pubic bones following the division, other things being equal, would be greater if made in the centre. If you made the incision to one side of the symphysis there would be less influence on the conjugate, for the influence on the conjugate would be almost entirely on one side. It is not objectionable that the incision be made through the cartilage; surgically it is better. As to the use of the saw, if it were a bone to be divided the saw would certainly be preferable. But as it is cartilage, and can be divided easily with any cartilage knife, I think the saw is not desirable; and the rapidity with which the saw cuts involves the necessity that

you be perfectly certain that it touches nothing else. It certainly is more important that a man simply be cool and understand the anatomy of the parts than that he spend much time in the selection of instruments. There is not a man in the house, I have not a doubt, who could not perform the operation with perfect safety with the ordinary cartilage knife.

ABSTRACTS.

1. Gaillard, L.: Cholera and Pregnancy (*Arch. de Toc. et de Gyn.*, January, 1893).—Pregnant women seem to be specially exposed to danger during epidemics of cholera. Laveran, in his "Dictionnaire Encyclopédique," says: "If cholera supervene during pregnancy the fetus dies and is prematurely expelled. Abortion aggravates the condition of the mother, the danger increasing with each month of pregnancy. Should the attack of cholera be light the abortion may not occur. When abortion or labor does take place it is during the reaction and not in the algid period. The patient falls into a torpid condition. When pregnancy has reached term the result is usually fatal."

During the epidemic of 1866 Horteloup had under his care eleven pregnant women attacked by cholera, of whom nine aborted, eight died on the first or second day following the abortion, one died before there was time to miscarry. The same year Potain witnessed the death of two women under the same conditions, one of whom aborted. One woman, advanced eight and one-half months in pregnancy, died in less than twenty-four hours; a post-mortem Cesarean section was performed, but the fetus had died before the mother. Moutard-Martin, however, reported more favorable cases at every stage of pregnancy.

Of seven cases observed by Gaillard in the epidemic of 1892 five terminated fatally, two were lightly attacked and recovered. Of the fatal cases, 1 was seven months pregnant. The fetus was expelled on the second day. Intravenous transfusion was resorted to. The patient died on the sixth day. 2. Eight months pregnant. Fetus died on the sixth day; was not expelled. Death on the eighth day. 3. Six months pregnant. Intravenous transfusion performed on the fourth day. Death of fetus on seventh day. No expulsion. Patient died on tenth day. 4. Patient six months pregnant and victim of pulmonary tuberculosis. Death

of fetus on ninth day; no expulsion. Death on fourteenth day. 5. Eight months pregnant. Fetus died before patient entered hospital; was expelled the eleventh day. Intravenous transfusion *in extremis*. In four of these cases the symptoms at first did not seem to point to a fatal result, and had pregnancy not existed Gaillard would have been confident that energetic treatment would result in a cure. He accounts for the mortality by the fact that the organism during pregnancy is in a condition of diminished resistance, and the comma bacillus easily invades it.

Premature labor might possibly save the child—probably not—while it would surely kill the mother.

A. R. S.

2. GAILLARD, L.: CHOLERA AND LACTATION (*Arch. de Toc. et de Gyn.*, March, 1893).—From observations of four hundred cases of cholera the author states it as his opinion that pregnancy constitutes by far the most serious complication, ranking before even senile debility, alcoholism, and phthisis. Lactation, however, does not seem to be a serious complication. Out of ten patients attacked with cholera, all of whom were nursing their own children, and several of whom were in a state of extreme debility, six recovered.

The mammary glands are very frequently engorged and painful. The diarrhea of cholera, which suppresses the activity of the kidneys, dries tuberculous cavities, and causes, as if by magic, the disappearance of hydrothorax, ascites, and edema, has no analogous action upon the secretion of milk. Magendie finds an explanation of this phenomenon in the situation of the mammary arteries near the heart.

A. R. S.

3. NGUYEN-KHAC CAN (Algeria): INFLUENCE OF A SINGLE LIGATURE OF THE CORD UPON DELIVERY (*Arch. de Toc. et de Gyn.*, February, 1893).—Out of sixty-eight cases of labor with double ligature of the cord there were four cases of retention of the placenta; and out of one hundred and forty-six cases with a single ligature, only two cases of retention. The duration of delivery of the placenta was much longer in the first cases, averaging sixty-four minutes, while in the second it gave an average of twenty-seven minutes. Whatever the mechanism of placental delivery, utero-placental hemorrhage contributes to the result either by pushing the placenta, as air pushes the piston in a cylinder (Baudelocque), or by throwing the placenta into folds and thus diminishing the surface in contact with the uterus.

With a single ligature the evacuation of placental blood through the cord creates a flow of blood from the uterine sinuses, or a utero-placental hemorrhage, favoring separation of the placenta; the uterus being essentially a reflex organ, any disturb-

ance, such as hemorrhage, initiates contractions which hasten the expulsion. Moreover, the placental hemorrhage, diminishing the volume of the placenta and throwing it into folds, expedites its delivery.

Gavilan considers most cases of retention of the placenta due to the pressure of external air upon its fetal surface. Simple ligature determining a placental hemorrhage diminishes the volume and the uterine and fetal surfaces of the placenta by shortening the diameter of the disc, and the utero-placental hemorrhage upon the uterine surface of the placenta causes a pressure contrary to the external pressure.

Double ligature should be reserved for cases of twin pregnancy.

A. R. S.

4. Richelot: Surgical Intervention in Severe Cases of Pelvic Neuralgia (*Arch. de Toc. et de Gyn.*, January, 1893).—A serious responsibility rests upon the shoulders of the surgeon who undertakes a radical operation for the cure of uterine and ovarian pains *sine materia*. The patients usually possess healthy organs, and are often young women capable of bearing children; even in older women the gravity of the operation and the uncertainty of the result should prevent temerity. Only the most severe cases, absolutely non-amenable to all conservative treatment, should justify the operation. One exception only exists, that of women whose social condition is such that rest and prolonged treatment are an impossibility. The common sense of the physician must be trusted to decide upon the proper course in such cases. Richelot expressly states that, in considering the utility of a radical operation for neuralgia, he means only the most severe type of pain, situated in the uterus or the appendages, corresponding to no discoverable lesion, and accompanied by a general neuropathic condition.

It is not to the point to say that a surgeon does not amputate the arm for relief of pain in the shoulder; that the relief afforded by the operation is due to the fact that neuropaths are cured by anything or by nothing, if only they can be convinced that the proper thing is being done for them. If a woman has been subjected to prolonged treatment, if everything possible has been done for her relief with no beneficial results, if she has been bed-ridden, and if after the operation she is without pain, arises and resumes her ordinary avocations, it is difficult to resist the conclusion that this altered condition is a direct result of the surgical intervention.

Laparatomy and vaginal hysterectomy are the two procedures under consideration. The former may be limited to a simple exploration, or include rupture of adhesions, partial resection of an ovary, unilateral castration, or bilateral extirpation of ovaries

and tubes. The latter may mean ablation of the uterus alone or of the appendages as well.

Up to the present day laparatomy has been the only operation discussed. Richelot considers it far inferior to vaginal hysterectomy. He has himself performed the latter fifteen times for cases only partially cured by ovariotomy, in five of which the neuralgia was the chief symptom. In all of them the result was good.

Out of nine cases of hysterectomy not secondary to laparatomy, eight were successful. One of the patients no longer complains of pelvic pains, but has fatal cardiac disease; two have been relieved of the pelvic pain, but complain of slight neuralgia elsewhere; five are perfectly well after a lapse of six, ten, and eleven months, and in one case five years. The operation has to recommend it its relative simplicity, the fact that there is little use in preserving the uterus after removal of the ovaries, besides many theoretical reasons in favor of total extirpation. Extreme caution, however, should be exercised in deciding whether or not to operate.

A. R. S.

5. Blanc, Edmond: Dystocia due to Imperfect Ossification of the Fetal Head (*Arch. de Toc. et de Gyn.*, April, 1893).—At the termination of a normal pregnancy, with normal pelvis and a normal condition of the fetus, we sometimes find that labor is unduly prolonged; that regular and forcible contractions are of no effect; that the head becomes fixed in the excavation, in which it ought to make easy progress, flexion being incomplete or exaggerated, or some faulty inclination of the head or abnormal rotation interrupting the normal progress of labor. After long and fatiguing efforts uterine inertia supervenes and the forceps are called into requisition. Upon examination the cranial bones are found to yield easily to pressure, giving rise to parchment-like crepitation. The fontanelles and sutures are very large. In short, the head is incompletely ossified, and in this imperfect development is found the cause of the tedious labor.

Strangely enough, this subject has found little mention in the text books. The three things to be considered in labor are the expulsive force, the fetal head or some movable body, and the parturient canal. The cranium, by virtue of its pliancy, can adapt itself to the shape of the canal and thus add a modification, in size of the presenting part, to the advantages obtained by flexion. It is easy of comprehension that too great ossification of the head and obliteration of the sutures cause delay in, or arrest of, labor. The same result may be produced by the opposite condition, although one would naturally suppose that an exceedingly pliable head would adapt itself peculiarly well to the canal; on the contrary, the soft mass will flatten itself

against or upon any obstacle that it meets, instead of pushing its way past it. The uterine contraction will, instead of causing it to progress, simply result in the production of a distorted position.

The perineum, especially in primiparæ, is, however, the chief cause of trouble. Instead of a hard, solid body which moulds and pushes the perineum into a channel for its passage, a soft mass presents, and with every contraction is flattened out like a ball of putty, consequently making little progress.

These heads are more like balls partially filled with fluid than like solid bodies; the propulsions received from above downward are transmitted to every part of the mass, which is pushed against the walls of the excavation, with a resulting notable increase of passive resistance.

The presence of a non-ossified head having been determined, we should not forget our forceps. The dangers of this abnormal condition may be summed up as follows: tedious labor, malpositions, rotations, faulty flexion, arrest of the head in the excavation of the pelvis or on the perineum, the necessity of instrumental delivery, the danger of cerebral or even bulbar compression through the cerebro-spinal fluid.

A. R. S.

6. Herrgott, Alphonse: A Study of the Pathogenesis of Puerperal Eclampsia (*Annales de Gynécologie*, January and February, 1893).—According to Depaul the various hypotheses in regard to the pathogenesis of puerperal eclampsia can be tabulated as follows: 1. Eclampsia is due to cerebral congestion. 2. Eclampsia is a neurosis. 3. Eclampsia is the result of a renal lesion. 4. Eclampsia is the result of some alteration of the blood.

He unhesitatingly believes the fourth hypothesis to be the correct one, but professes ignorance of the nature of the alteration. Delore, of Lyons, believes that eclampsia is of bacterial origin. Doléris found in the albuminous urine of several women a micro-organism characterized by long, nodular chains composed of short bacillary segments, interrupted at intervals by small or highly refractive masses or series of masses. The inoculation of rabbits with these organisms very rapidly caused albuminuria. Doléris eventually formulated the following conclusions: 1. Micro-organisms may be found in the bladder of pregnant women independently of albuminuria, and not of renal origin. 2. Albuminuria is met with in five per cent of pregnant women. Micro-organisms are constant in the urine of these patients, with a preponderance of streptococci. 3. The blood of pregnant women suffering from albuminuria almost always contains micro-organisms, demonstrable by cultures. 4. *The urine and the blood of certain patients suffering from eclampsia and albumin-*

uria contain microbes, which increase and decrease in number with the convulsive attacks and their subsidence.

Finally, in a third report to the Biological Society, Doléris states that he found in the blood of five patients suffering from eclampsia a crystalline substance, insoluble in water, soluble in acidulated water and in ether, which does not behave toward coloring matters as do the ptomaines, but which causes the death of rats and birds into which it has been injected. The existence of a toxic substance in the blood of those suffering from eclampsia has recently been confirmed by Chambrelant. Bouchard demonstrated the fact that in eclampsia the urine, which is eliminated in small amount, is free from the toxic properties possessed by normal urine. Tarnier and Chambrelant have shown that the blood of these same patients contains more toxic properties than normal blood, these properties becoming more potent as the eclampsia is more severe.

What is the origin of this *poison?* Is the toxine produced by the patient and is it the cause of the eclampsia, or is it a toxine secreted by a microbe which finds in the organism, as modified by gestation, a ground suitable to its growth and development? In other words, is eclampsia an *auto-* or a *hetero-*infection?

E. Blanc in 1887 made a series of experiments upon rabbits, into which he injected a microbe found in the urine of eclamptic patients, with the following results: 1. *General convulsions*, followed speedily by the death of the rabbit. A gravid condition caused special predisposition. 2. *Intense inflammatory swelling at the seat of inoculation.* This occurred in animals which had resisted the grave immediate consequences; it was soon followed by sphacelus. 3. *Various accidents of an infectious nature*, miliary abscess, phlebitis, elevation of temperature. 4. *Determination of renal lesions of various degrees of severity, and albuminuria.* In 1889 Blanc made cultures from the blood and urine of patients suffering from eclampsia, and found a microbe in the form of an elongated coccus or of a short bacillus.

The author conducted a series of experiments with the blood and urine of seventeen women suffering from eclampsia. The results were negative in all cases of inoculation with the blood and in all but two with the urine. Of six rabbits inoculated with this urine four died: one at the end of three days, one four days, a third five days, and the fourth three weeks.

In 1892 Messrs. Combemale and V. Bué, as a result of experimentation, declared that staphylococci were the active agents in the causation of puerperal eclampsia and that the soluble products of the staphylococci are capable of producing eclampsia.

Herrgott believes, in conclusion, that the convulsions observed in parturient women, which are characterized by the general name of eclampsia, may be produced by two different

causes. The first is the result of an auto-intoxication caused by some kidney lesion, as observed in the various forms of Bright's disease. Pregnancy, doubtless, may produce this pathological condition, and certainly always aggravates it when it pre-exists. The convulsive attacks in these cases are analogous to those observed in true uremia; the urine contains or has contained débris of the renal epithelium, and albumin. The second variety of eclampsia is produced by a special pathogenic microbe, which finds a suitable field for its development in the organism as modified by pregnancy. The elevation of temperature, the clinical phenomena, and the anatomical lesions are such as are found in the infectious diseases. The albuminuria, which may be absent (Charpentier having noted one hundred and fourteen cases of eclampsia without albuminuria), is like that found in scarlatina, diphtheria, etc. In short, everything goes to prove that there is a type of eclampsia which is a hetero-intoxication.

It is probable, although not yet demonstrated, that the eclampsia is not caused directly by the microbe, but by the action of a toxine, produced by this microbe, upon the nervous system modified by pregnancy. Science cannot as yet prevent the entrance of this microbe, but it can diminish its effects by antidotes, either in the form of intestinal evacuants or by diuretics, chief of which is *milk*. A strict milk diet in such cases cannot be too strongly insisted upon.

A. R. S.

7. Pozzi, S.: Conservative Operations upon the Ovary (*Annales de Gyn.*, March, 1893).—One of the marks of the progress of surgery is the adoption of preservative measures, a good example of which is seen in the case of the substitution of resections for amputations in operations upon bones and articulations. Might not the same principles be applicable to the surgery of the ovaries and tubes?

Pozzi believes in this possibility, and submits the results of several cases, acknowledging that they are too few in number to permit of dogmatic assertion as to their value, but hoping that they may inspire other physicians to make researches in the same direction.

When the appendages and ovaries are completely degenerated, as in cases of pyosalpinx with ovarian abscess, or complete cystic transformation of the ovary and parenchymatous degeneration of the tubes, it goes without saying that there is but one method of treatment—extirpation. We know, however, that the adnexa are often removed when the lesions are of less extent—as, for instance, when there is hydrosalpinx with a relatively healthy ovary, one over which are closely scattered small follicular cysts; or a healthy tube and an ovary inflamed, or affected by sclerosis, micro cystic degeneration, or a few larger but sharply limited

cysts. In such cases there is something to be hoped for from conservative surgery. Partial resection of the ovary and partial resection of the tube may be practised. Pozzi believes the latter operation to be practically useless, as no tube once seriously inflamed can ever be restored to its normal condition. The ovary, however, can be operated upon with success. Lesions limited to a portion of the ovary, of course, offer the best chance of cure, such as an isolated cyst, dermoid, incipient proligerous, large follicular, cyst of the corpus luteum. The technique of the operation in these cases is simple. A probe introduced into the tube determines its permeability. The diseased portion of the ovary is removed by means of two incisions, and the lips of the wound are stitched together with catgut. The same maneuvre may be resorted to in the case of microcystic degeneration when there is left a band of healthy ovarian tissue. Pozzi in his later operations has united the fimbriated extremity of the tube to the remains of the ovary by means of a few stitches. This *salpingorrhaphy* prevents the tube from moving about and perhaps forming adhesions, and is especially useful in cases where it has had to be freed from adhesions before the operation.

The author substitutes *ignipuncture* for resection in cases where the lesions consist of scattered small cysts. These can easily be opened and their inner surface cauterized. When there is diffuse ovaritis, and the ovary is filled with fluid, the thermo-cautery should be introduced deeply into the edematous stroma.

It might be urged that cicatricial tissue would result from ignipuncture and cause new cysts by interfering with the normal development of the Graafian follicles. Pozzi believes that there is no danger of this occurrence within the peritoneal cavity, where strict asepsis is used, when the eschar is absorbed without inflammatory process. On the contrary, the observations made so far tend to prove that the irritation caused by the hot iron in the substance of sclerotic tissues favors their resorption. Microcystic degeneration might be caused by ignipuncture if the glands were tubular and so liable to become obliterated at the openings; but the follicles are closed, and those which the needle has not penetrated can develop perfectly.

Pozzi submits tables giving the results of twelve cases, of which six were operated upon by resection, six by ignipuncture. The results in all have been favorable. With the exception of one hysterical patient, all have been entirely, or almost entirely, relieved of pain. Menstruation has occurred with great regularity, and in several cases where it was formerly of an irregular type it has become regular. A. R. S.

8. Loubeau, E.: Contraction of the Urethra in Women (*Arch. de Toc. et de Gyn.*, April, 1893).—This disease, common

enough in the male, is of great rarity in the female. It may be congenital, but is more often acquired, and is then either of gonorrheal or of cicatricial origin. The gonorrheal form is extremely rare. Cicatricial contractions follow ulceration and traumatism. Owing to the dilatability of the canal the symptoms are slow in appearing; at first a slight difficulty in micturition is experienced, followed by the sensation of a real obstacle, a lessened flow, pain in the pelvis, groins, and loins. Cystitis may occur. Catheterization becomes painful or impossible. By vaginal touch the urethral thickening may sometimes be appreciated. The course of the affection is progressive.

Diagnosis is established by the history and by an examination with the catheter. Inflammatory swelling of the urethral walls is to be excluded, as well as spasm of the urethra. Some polypi and tumors produce a real contraction of the canal, but can be identified by patient investigation. Deviation of the urethra in cases of vesico-vaginal fistula may simulate an obliteration.

The treatment must vary according to the case—cauterization, incision, electrolysis, dilatation, have all been resorted to. The author reports a case of contraction due to cicatrization following cauterization for the removal of a polypus. The passage was almost entirely closed, but immersion in hot baths caused a flow of urine when all other measures had failed. Progressive dilatation was impossible, as no bougie or catheter could be introduced, hence internal urethrotomy was resorted to. A narrow bistoury was used, introduced horizontally following the normal direction of the urethra, and inserted to a depth of a little over one inch. The venous hemorrhage ensuing was copious, but easily controlled by compression. There was no post-operatory incontinence of urine, and not the slightest fever.

A. R. S.

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ORIGINAL COMMUNICATIONS.

THE PRESENT POSITION OF PELVIC SURGERY.[1]

BY

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IT is my first duty and privilege to thank you for the honor you have conferred upon me in electing me to this position, and secondly to congratulate you upon the auspicious circumstances attending the sixth annual session of our Association. As the foundation of this organization was the natural result and inevitable outcome of circumstances which tended to circumscribe and limit the cultivation of gynecic surgery in America, so the growth and prosperity of our society have demonstrated the need of an organization extending such privileges widely among the profession. It is contrary to the genius of our American institutions, and opposed to the broad catholic spirit of science, for a limited number of the profession to assume the exclusive right of a privileged class—an aristocracy in science, as it were

[1] Being the President's address at the sixth annual meeting of the American Association of Obstetricians and Gynecologists, Detroit, Mich., June 1st, 1893.

—claim the prerogatives of a national organization, and debar from membership honorable members of the profession, capable and desirous of advancing the science and improving the practice of gynecology. Exclusive methods, and the abuse of the blackball in secret session, necessitated the establishment of a society upon a broader and more liberal basis, open to all reputable members of the profession who desire to cultivate the great specialty of gynecology. The limit of membership has been enlarged from time to time, so that no worthy applicant has been refused admission to our ranks; and, as you know, a resolution is now pending to make the membership unlimited, as in the British Gynecological Society. I hope this will be done, and that the Executive Council will see to it that all American physicians engaged in promoting the knowledge and improving the practice of gynecic surgery and obstetrics are invited and welcomed into this Association. Our membership already includes a number of able and distinguished members of the profession in Canada, and I hope we will in time claim a good representation in South American countries.

The publication of our papers and discussions in the medical journals has greatly extended the influence of our work and has been appreciated by the profession. It is gratifying to note that other similar societies, which formerly limited the publication of papers to the pages of an annual volume of Transactions, have adopted this method. Our five volumes of Transactions have been accorded a most cordial reception by the profession both in America and Europe, and the commendatory reviews and letters relating thereto attest the high standard attained in our work. This should stimulate us to constant attendance at the annual meetings and renewed exertion in the work before us.

I have selected as a subject for some remarks upon this occasion "The Present Position of Pelvic Surgery," thinking I might present some general observations in this way which may be of interest and which cannot be readily included in the discussion of special topics. But little more than fifteen years have elapsed since pelvic surgery could claim a distinct place as a branch of the healing art. Gynecology was limited for the most part to the plastic surgery of the vagina and perineum and the mechanical treatment of uterine displacements, while ovariotomy was relegated to surgery, and the accidents and con-

sequences of pregnancy and labor were left to the obstetrician. In our educational system the diseases of women were taught along with children's diseases as an appendage of the chair of obstetrics, and pelvic surgery was a very insignificant part of the general surgeon's field of labor. Thus distributed as a subordinate, kindred branch of obstetrics and surgery, gynecology had no definite or distinct place in our educational curriculum or in the practice of our art. The class of operations now applied most effectively in gynecic surgery were for the most part unknown, and conditions now curable were not only beyond reach of treatment, but were unrecognized. These conditions were classed under the head of obscure diseases, and were treated with medicine and outward applications until discharged as incurable or until death put an end to suffering.

The introduction of new methods of operating, based upon an appreciation of minute organic substances in relation to inflammation, suppuration, and systemic infection, made a new era in all departments of surgery and created an entirely new system of gynecology. Our knowledge of modern peritoneal surgery began with this new era, and with it the physiology and pathology of the pelvic organs were recast. Under the same influences the management of labor and the puerperal state was revolutionized, and the prevention and treatment of puerperal fever were placed upon a correct basis, to the great saving of life and prevention of disease. The obstetrical operations, characterized by a fatality that was extreme, were rendered safe and practicable.

After ovariotomy had been practised some years it was abandoned on account of its severe mortality. It was revived and made practicable by a few courageous men in America and Great Britain. With the opening of the new era it was advanced to a position of safety and efficiency which soon made it the most successful major operation known to surgery. When the long-established fear of the peritoneum was dissipated, and it was demonstrated that this membrane could be opened and treated with safety, knowledge of the pathology of the pelvic organs rapidly grew and light was thrown upon hitherto dark and fatal conditions of disease. Diseases of the Fallopian tubes and ovaries, the sequelæ and complications of puerperal diseases, gonorrhea, and traumatic infections, were shown in their true relations and treated with success.

Ectopic gestation was elucidated and placed within the category of curable diseases, and neoplasms of the ovary and uterus were made amenable to radical treatment instead of the long-drawn methods of expectancy and tinkering which were followed with uniform disappointment and disaster. The radical cure of cancer of the uterus by complete excision was made practicable. Many painful conditions of the pelvic organs, formerly unsuccessfully treated by local and systemic medication, were made amenable to treatment, and operations hitherto complicated and uncertain were made simple and sure.

All these great advances in pelvic surgery were accomplished in a few years; and while the advance was so rapid as to render obsolete existing authoritative works on gynecology, we must in justice remember that all this was made possible by the patient toil and splendid achievements of the pioneers of a preceding generation. The brilliant achievements of the present period would not have been possible without the labors of such men of courage and genius as McDowell, Sims, the Atlees, Baker Brown, Simpson, Bernutz and Goupil, Peaslee, Spencer Wells, Kœberlé, and Keith.

The present position of pelvic surgery is in many respects unique. From its beginning, as already indicated, this branch of surgery has been promoted and advanced by the labors of a few men. The history of ovariotomy throughout a long period is the history of pelvic surgery. The fate of this operation was for a long time centred in the personality of a few courageous individuals. The high position that operation has attained is at the present time due for the most part to the fact that its recorded results are made by a few operators. When the new surgery of the peritoneum was introduced it was seized upon in a reckless way by many, and for a time its very existence was threatened. The splendid results of the few who were qualified by training and experience were made the basis of operations by many wholly unprepared for this exacting and difficult work. Operations were undertaken upon inadequate and erroneous conceptions of pathological conditions, and often, indeed, without any definite pathological data whatever, until in many influential quarters great discredit was thrown upon the work of able and conscientious men who were masters of pelvic pathology and pelvic surgery. Though in much less degree, this condition continues to obtain even at the present time, and deserves

thoughtful consideration. It is my firm belief that this will continue until the practice of gynecology and pelvic surgery is as generally recognized by the profession as a specialty as is ophthalmic surgery. I do not mean by this that a gynecic surgeon should be one of narrow and limited training and experience, for in no department of practice is a general knowledge of medicine and surgery more essential. The views of the late Sir Morell Mackenzie upon this point are so sound and practical that I give them in his own clear words: "It is impossible that a man can be a really good specialist without possessing a general knowledge of disease; and when I say general knowledge I do not mean such a knowledge as can be obtained in a student's career, or even such as can be acquired by the holding of minor appointments at the termination of a hospital curriculum. What I consider requisite is such a familiarity with morbid processes as can only be acquired by those who are in the habit of using all the resources of their art in combating the great varieties of ills which flesh is heir to. In my opinion only those who have acted as general practitioners for some years, or have held appointments as physicians or surgeons to general hospitals, are thoroughly equipped for practising as specialists. It is only after thorough knowledge has been obtained in many departments of medicine that training and experience can be focussed with advantage on a single point." [1]

There is as much technical knowledge and education of sense involved in the correct diagnosis of pelvic diseases as in the diagnosis of intra-ocular diseases with the ophthalmoscope. I mean by this that while with the touch the minute details of intrapelvic lesions may not be so accurately discovered as eye lesions by the visual examination of the surgeon, the decision of the essential question of operative interference and treatment involves quite as much special knowledge—knowledge only to be acquired by laborious and prolonged training. Two years ago one of our Fellows, whose work has done as much as that of any one to advance our knowledge of pelvic diseases and their treatment, remarked to me that he often doubted if pelvic surgery would be maintained and permanently established; adding that there was so much imperfect, incomplete, and unsuccessful work being done by those who have not prepared them-

[1] Presidential address delivered at the first meeting of the British Laryngological Society, November 14th, 1888.

selves for it by special study and training that the profession may lose confidence and put aside the good for fear of the bad.

It is a unique and remarkable incident that the most severe criticism of those engaged in pelvic surgery as a specialty has emanated from those to whom the criticism indulged is most applicable. The *éclat* of what the general surgeon calls a "laparatomy" seems to many irresistible. Without more than a cursory, general, and meagre idea of the pathology of the pelvic organs, and adopting the deceptive general indication of menstrual pain without the convincing evidence of touch, they assume the existence of operative indications and resort to removal of the uterine appendages. Oftentimes, with no deeper conception of the purpose of such a procedure than the arrest of menstruation, without reference to the existence of demonstrable lesions, this important operation is performed. And yet these surgeons are the most severe critics of the painstaking specialist, who operates only for lesions otherwise incurable, and after normal functions have been destroyed. It is a fact capable of proof that this operation is most abused outside the specialty, and that the plea for careful discrimination and limitation of the operation has been, and is now, urged by those practising gynecology as a specialty. In this connection I would remark that likewise the exploratory incision is entirely misconstrued in its range of application by the same class of surgeons. It is altogether wide of the mark to presume that one is justified in resorting to an exploratory abdominal section in supposed intrapelvic disease, unless a high order of skill has been utilized by established diagnostic measures and the condition is one progressively undermining vitality or endangering life.

When I say that pelvic surgery deserves recognition as a specialty, I mean in the sense that those who practise it should give to its pathology, symptomatology, and operative methods special study and undergo preparatory training. Emergency operations like appendicitis, penetrating wounds of the abdomen, intestinal obstruction, operations on the gall bladder and cystotomy, must necessarily be included in a general surgeon's training and scope of work, requiring of him practical knowledge of the technique of abdominal surgery. Likewise the general surgeon must master the technique of brain surgery, but that does not make of him a neurologist. Pelvic surgery

and abdominal surgery are quite distinct. While both have in common the management of peritoneal invasion, the method of operating and the pathology are different. By way of demonstrating this point it is only necessary to call attention to the difference in the methods of abdominal surgeons and pelvic surgeons. The older operators, like Spencer Wells and Keith, have never adopted modern pelvic surgery. They operated for large tumors, and have refused to accept the modern pathology and operative treatment of inflammatory diseases of the uterine appendages. Pelvic surgery is of modern origin, too recent in the exposition both of its pathology and operative methods for adoption by the old school of abdominal surgeons, who deal alone with gross lesions and large tumors.

Again, if we look at the operative methods of the general surgeon in abdominal and pelvic work, we have the most positive illustration of the distinction I desire to emphasize. The general surgeon in abdominal work adheres to the long incision with its increased exposure; the liberal array of instruments, including retractors and needle holders, with the increased danger of sepsis; multiple ligaturing and protracted manipulation; elaborate suturing and complicated drainage. The pelvic surgeon works through a small incision, relying upon an educated touch in all intrapelvic manipulations; reduces peritoneal exposure to the minimum; sees that only the operator's hand is introduced; limits his instruments to those absolutely necessary, recognizing that each additional instrument is a possible source of infection, involving additional exacting care; strives to operate with deliberate rapidity, in order to abbreviate anesthesia and lessen shock; relies upon special methods which have been evolved, tested, and approved by experienced pelvic surgeons in controlling hemorrhage, cleaning the peritoneum, and securing drainage; and reduces all ligaturing and suturing to a standard of simplicity with accuracy and efficiency. To accomplish the results required by the established standard of modern pelvic surgery, those who practise in this branch must acquire a thorough knowledge of the physiology and pathology of the pelvic organs in woman, become familiar by practical experience with diagnostic methods so as to have an educated touch, and, by training at the elbow of some skilled operator, master the operative technique sufficiently to do accurate and uniform work. This is the sum total of my contention. The pelvis is

not the field to learn surgery without great sacrifice, and a thorough training in general surgery does not fit one for the practice of pelvic surgery. When this fact is disregarded the results will demonstrate its verity.

It is doubtful if in any branch of medicine or surgery so much of contention and opposition has been encountered as in establishing the present exalted position of pelvic surgery. By a combination of unfortunate circumstances, here was fought the battle of antisepsis and asepsis. Individual antagonisms of eminent men identified with these questions, and the opposition of a large element of the profession who oppose all innovations which threaten to undermine the sway of established position and influence, all combined to awaken prejudice, to obscure truth, and to place both new methods and their advocates in the false light. Fortunately, however, such conditions are of brief existence, and truth and right, when persistently and faithfully maintained, cannot long be suppressed, even though for a time they be misinterpreted and their advocates misjudged. No other department of medical or surgical practice was ever placed upon such a purely statistical basis, and in no branch of surgery does a single death do so much prejudice to surgeon and surgery as obtains in the practice of pelvic surgery.

The acceptance and application of the advanced principles of pelvic surgery were also obstructed and delayed by appeals to sentiment, which did much injustice to its cause. Just as the old ovariotomists were refused consultation and accused of murder, modern pelvic surgeons were denounced as mutilating women and performing castration. The latest, and I trust the last, exhibition of this absurd perversion of facts has been exhibited recently in Pennsylvania, whereby it was attempted to misrepresent the scientific application of surgical treatment in intrapelvic disease in insane women.

It has taken years of insistence to make a large element of the profession comprehend that the uterine appendages are subject to various pathological changes which destroy their functions and disintegrate their structures, impair the health and destroy life, and are only cured by removing the diseased structures with contained septic products. Not taking time and trouble to inform themselves as to the pathology and results of these diseases, they go on talking of "removing the ovaries," as if any accepted doctrine of modern pelvic surgery justified

the ablation either of normal organs or of those capable of being restored to healthful activity.

It is not within the scope of this address to even outline the advances which have recently been made in pelvic surgery. The great discoveries relating to ectopic pregnancy and its treatment, to inflammatory diseases of the appendages, the improved Cesarean section and the Porro operation, the surgical treatment of uterine myomata, have been perfected until they are established in practice. The greatest advance, perhaps, is the steady progress in simplifying the operative technique so as to effectually overcome sepsis. By doing away with all chemical agents and practising a rigid system of cleanliness, results have become more perfect and uniform in the skilled hands of the trained pelvic surgeon. It should be a steady and persistent effort of all engaged in this work to attain a standard by which the profession and the laity will recognize that simple opening of the abdomen is not of itself, in skilled hands, a step of uncertainty and danger. Many lives are lost by denying the patient early operation, because the operation itself is regarded as more dangerous than the disease. It is the danger of sepsis, now as heretofore, which is most formidable and which requires most labor and vigilance to avoid. It requires long training and constant, exacting care to eliminate it from the causes of disaster. To place pelvic surgery upon a basis of scientific exactitude and security, demonstrated by results approaching uniformity, is the way in which to maintain and elevate its standard. This can only be done by limiting the work to those qualified for its exacting demands; and such results will be promoted by earlier resort to operation in cases requiring operative treatment. If the surgery of the eye were done so unrestrictedly as is pelvic surgery at the present time by general surgeons, it is doubtful if the people would seek relief from cataract with as little hesitation as women now do for ovarian tumors. The penalty of contaminated instruments and hands is more severe in peritoneal contact than in the eye, and the necessity for special technical knowledge and skill quite as absolute.

The highest conception and appreciation of a high standard of special skill in pelvic surgery obtain with the educated general practitioner. The conscientious, well-informed general practitioner is the natural associate and colleague of the specialist. The general practitioner, as a rule, determines the necessity for

operative interference and shares the responsibility of the surgeon's work. It is to his interest in every way that the work be most perfect and the results the best. He shares the success of the specialist and incurs with him the inevitable penalty of failure. The general practitioner is of necessity a student of the progress of pelvic surgery. He cannot afford, for example, to permit the woman with ruptured tubal pregnancy to lie bleeding until death quickly ends the scene. It is his imperative duty, as also in his own plain interest, to recognize the condition and call the skilled operator to secure the bleeding vessel in time.

In conclusion, there cannot be other than satisfaction in the present exalted position of pelvic surgery, and established confidence in its future. The day of probation is past, and both the profession and the public are realizing more and more the substantial results of skilled work. The responsibility resting upon such surgeons as compose the fellowship of this Association cannot be overestimated. To counteract the direful results of dirty and incomplete work; to establish confidence where doubt and misgivings exist; to perfect and improve methods in use and extend our knowledge; to encourage the cultivation of special skill; to diffuse the advanced principles of this brilliant branch of our science among the profession everywhere, all with a view to saving life, restoring health, and promoting the welfare of our race—these are the objects and purposes of our organization.

COMPARATIVE MICROSCOPICAL STUDIES OF THE OVARY.

BY

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(With twelve illustrations.)

THE CORPUS LUTEUM OF PREGNANCY.

EVERYBODY is familiar with the time-honored expression, "corpus luteum." It is in a certain sense a misnomer, as we use the same term for the outcome of menstruation as well as for the outcome of pregnancy, affixing the explanatory epithet verum or spurium.

I am convinced that under normal conditions a corpus luteum menstruationis, or spurium, as usually described, does not exist, that whenever such a growth appears we invariably find it in a pathological ovary.

In a previous article [1] I described the so-called corpus luteum spurium, assenting in general to the researches of Dr. M. D. Jones. At present I propose to establish a distinction between the pathological endothelioma—so-called corpus luteum spurium—and the physiological corpus luteum.

Endothelioma is a growth in the ovary resembling the corpus luteum of pregnancy, but, in contradistinction to the latter, it is persistent, productive of pain, and liable to undergo changes, of which the formation of hematoma is the most important. Both formations are the result of ovulation: the corpus luteum of pregnancy developing in the normal ovary congested by supervening pregnancy; the endothelioma, on the contrary, in a pathologically altered ovary. In the former we see this body return to ovarian structure with the lessened congestion after delivery, while in the latter the growth, under the continuous irritation of oöphoritis, persists, nay, increases, to become a lasting source of bodily ailment.

The study of the corpus luteum verum, its development, evolution, and involution, is the topic of my present paper.

I thought it best to first resort to the examination of ovaries of domestic animals, since it appears reasonable to assume that such animals delivered to the abattoir may safely be considered to have been in normal condition. I have selected the sow, ewe, and cow, informing myself either as to the time elapsed since last delivery, or knowing exactly, by inspection of the contents of the uteri, how far gestation had progressed. I have entered also the study of a human corpus luteum from a case where I had performed laparatomy for tubal pregnancy of the left side, where I found a corpus luteum in the corresponding ovary. The certainty of diagnosis, as proven by anatomical examination of the removed organs, has induced me to select this case for microscopical studies.

The literature of the corpus luteum up to recent date is given in an introductory to an excellent article by Benckiser.[2] This author confined himself to the microscopical study of the

[1] American Journal of Obstetrics, vol. xxv., No. 5.

[2] Archiv für Gynäkologie, xiii.

corpus luteum of the sow. The conclusions he arrives at I would not consider altogether satisfactory, since he does not attempt to define the tissues composing this formation.

Whenever a matured Graafian follicle bursts, a loss of substance is the result after the escape of the ovum. The cavity thus formed must be filled up in a way similar to the filling of a cyst artificially emptied and treated by the surgeon with some irritating agent, or a loss of substance healing under aseptic conditions. The process of healing in the former instances is pathological, in the latter physiological; but in both cases the process in its intimate features is identical. Additional to the healing of a burst ovarian follicle is the feature of a more or less intense hemorrhage, since it is a blood clot that fills the cavity immediately after rupture. Should pregnancy follow the bursting of the Graafian follicle, obviously the hyperemia thus established in the female genital organs will cause a more intense reaction in the walls of the emptied follicle as well as in the vicinity. The final result is known to be a nodule of considerable size, far in excess of the original loss of substance. The results of my researches enable me to furnish a definition of the newly formed tissue as compared with analogous formations in other parts of the body.

The method applied for the preparation of the microscopical specimens is that advised by C. Heitzmann, in whose laboratory my studies were carried on—viz., hardening of the fresh ovary, or an ovary preserved in alcohol, in a one-half of one per cent solution of chromic acid, staining of the sections with ammoniacal carmine, and mounting in chemically pure glycerin.

Doubts have been raised against the feasibility of this method. They have induced me to examine specimens preserved and hardened in alcohol, stained with various agents, and mounted in Canada balsam. From my own experience I can vouch for the superiority of the method above mentioned, which yielded the clearest images, best fit for the study even with the highest powers of the microscope. Zeiss apochromatic objectives and compensating oculars were used.

A. The Human Corpus Luteum of Two Months' Standing.—The nodule, the size of a cherry pit, is embedded in the cortex of the ovary, and separated from the surface by a thin layer of cortical tissue. It consists of two portions: a peripheral, distinctly lobulated; and a central one, non-lobulated, holding in

its interior a fresh clot of blood, probably formed shortly before extirpation. In the clot a separation has taken place of the fibrin from the red blood corpuscles, which latter have a fresh, unchanged appearance and are saturated with hemoglobin. The lobular appearance of the peripheral portion is caused by radiating septa of fibrous connective tissue in connection with the outer capsule as well as with the central tissue of the nodule.

The outer capsule is made up of fibrous connective tissue,

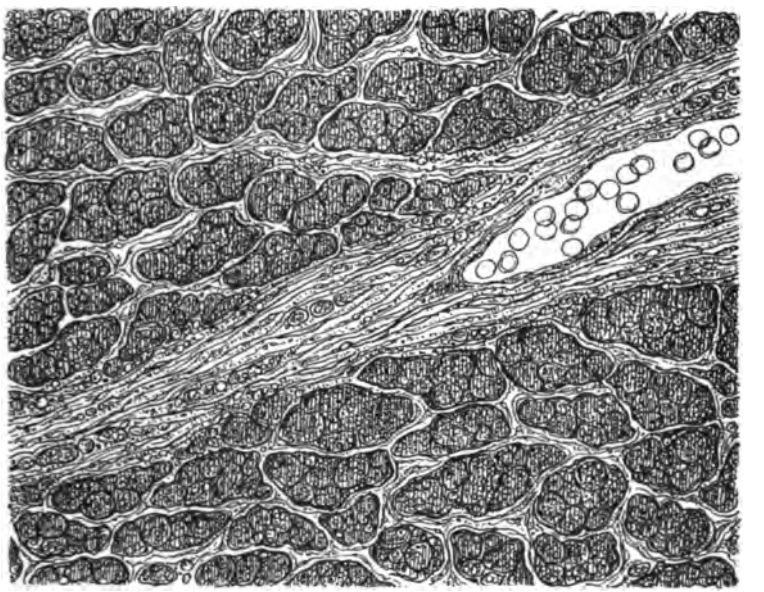


FIG. 1.—Corpus luteum in tubal pregnancy of two months; lobular portion. × 400. V, vein holding red blood corpuscles; S, S, septum of delicate fibrous connective tissue between two lobules; E, E, endothelia composed of medullary corpuscles; I, I, delicate interstitial connective tissue.

freely supplied with blood vessels, arteries, veins, and capillaries. The arteries and veins—the latter being filled with blood—are far more numerous than in the normal cortex of the ovary, including the cortex of that under consideration. The septa radiatingly traversing the nodule carry a large number of blood vessels, especially arterioles, in contradistinction to the central portion, in which blood vessels are scanty and mainly of the venous and capillary type. Since the whole nodule is newly formed, it is reasonable to maintain that all blood vessels of the

capsule, the septa, and the central portion likewise are newly formed. The tissue within the lobules is scantily supplied with blood vessels, and these are almost exclusively of the capillary type. With medium powers of the microscope this tissue has the appearance presented in Fig. 1.

We see groups or clusters of embryonal or medullary corpuscles embedded in an extremely delicate fibrous connective tissue carrying small capillaries. The medullary corpuscles are of a light-brown tint, though distinctly stained by a solution of am-

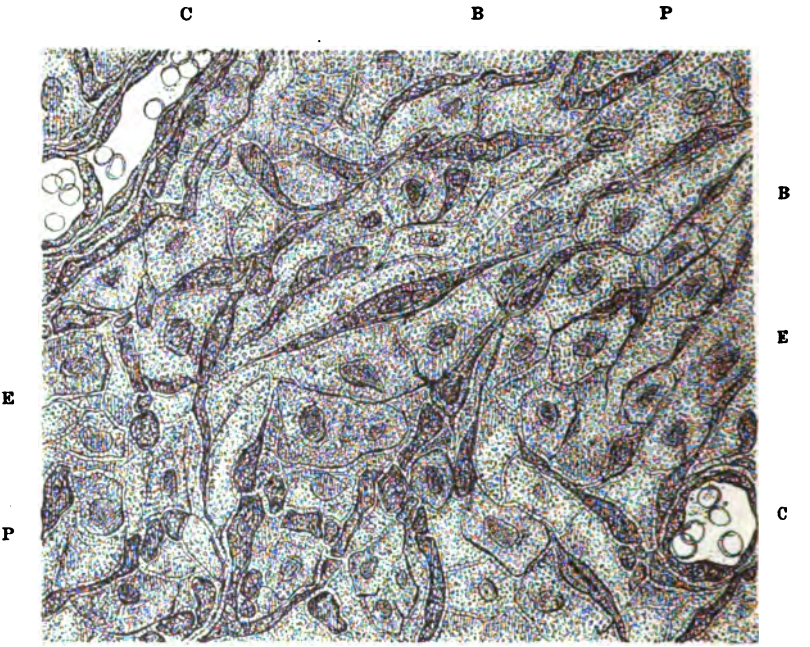


FIG. 2.—Corpus luteum in tubal pregnancy of two months; central portion. × 400. P, P, protoplasmic bodies, partly branching and interconnecting; E, E, nucleated endothelia in the process of transformation to basis substance; B, B, basis substance, still exhibiting the structure of protoplasm; C, C, capillary blood vessels in longitudinal and transverse sections.

moniacal carmine. In such stained specimens the septa have assumed a pure pink, the clusters, on the contrary, a brownish-pink color. The medullary corpuscles are of greatly varying sizes, coarsely granular, without nuclei, and separated from one another by a delicate light layer of cement substance. Their connections are rather feeble, and in some places of the specimen they appear torn asunder, leaving artificial gaps. High

powers of the microscope demonstrate a direct connection of the embryonal corpuscles by means of delicate threads, the same as in the indifferent corpuscles, building up the embryo after the segmentation has passed, or in the extremities spouting out from the embryo in the third or fourth week of embryonal life.

The septa are composed of fibrous connective tissue, the same as the capsule, and abundantly supplied with protoplasmic bodies, but the less infiltrated with basis substance the nearer the central portion of the corpus luteum. Quite different is the aspect of the central portion (see Fig. 2).

Here we observe numerous partly branching and interconnecting protoplasmic bodies of greatly varying shapes, well stained with ammoniacal carmine, whereas the portions between the bodies are only of a pale-pink color or lack color altogether. With medium powers of the microscope many of the branching protoplasmic bodies appear nucleated and all of them coarsely granular. In the tissue between them, on the contrary, the nuclei are scattered, globular, and the intervening fields finely granular. On analyzing the latter fields we can easily see the division into finely granular bodies or fields, greatly varying in size. In this portion we obviously have a transition of protoplasm into basis substance. Through this transformation the protoplasm is paling, since it is infiltrated with basis substance, whereby the original reticulated structure is retained and still perceptible. The nuclei of the protoplasmic bodies at first remain unaltered and tingible with carmine; later on many of the nuclei are likewise infiltrated with basis substance, becoming pale and faintly discernible, until at last the majority of nuclei are rendered invisible by being saturated with basis substance, the same as the rest of the protoplasm.

The features described in the human corpus luteum are worth studying with the highest powers of the microscope (Fig. 3).

The lobular portion (E) is seen to be composed of clusters of indifferent or medullary corpuscles. This fact is of importance, since it enables us to understand the structure of the fully developed corpus luteum. The large protoplasmic bodies appearing in the corpus luteum, termed by previous authors "lutein cells" or "epithelioid cells," I shall term endothelia. The study of the early stage of its development entitles me to the assertion that each endothelium is the result of the confluence of a number of

indifferent or embryonal corpuscles. A certain number (eight to twelve), originally coarsely granular, non-nucleated, and separated from one another by light rims of cement substance, though interconnected by extremely delicate fibres, coalesce to form a large protoplasmic body, termed endothelium, which contains, as a rule, one distinct nucleus.

The lobules of the peripheral portion are surrounded by fibrous connective tissue. This tissue sends tender offshoots between the groups of embryonal corpuscles, which remain even

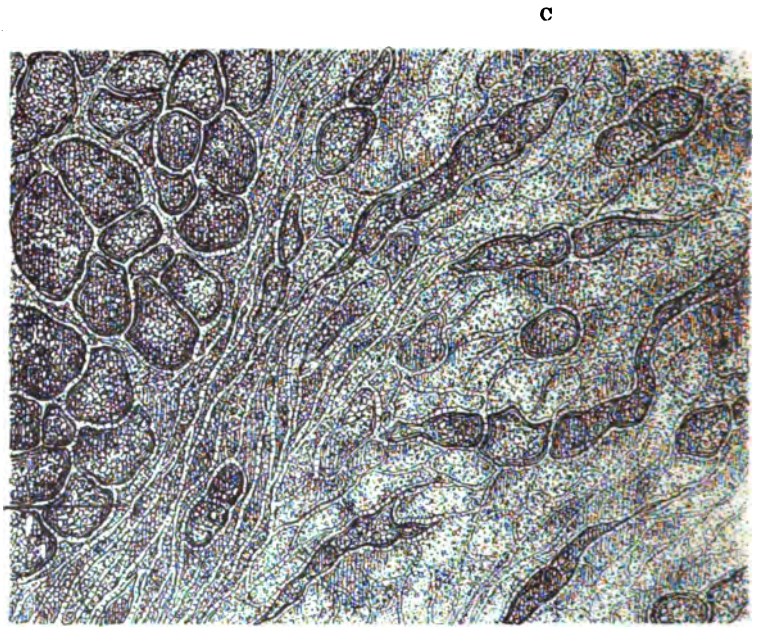


FIG. 3.—Corpus luteum in tubal pregnancy of two months. × 1200. E, endothelia of the lobular portion, made up of medullary corpuscles; F, fibrous connective tissue forming septa between the lobules and the central portion of the corpus luteum; C, central portion of corpus luteum; P, protoplasmic bodies of central portion; M, protoplasm in transformation to myxomatous basis substance.

at the full height of the development of the corpus luteum, ensheathing each endothelium.

In our specimen the fibrous tissue of the septa shows complete infiltration with glue-yielding basis substance, and holds a limited number of protoplasmic bodies, so-called connective-tissue corpuscles. Upon approaching the central portion the fibrous connective tissue is seen to be more protoplasmic in nature and more freely supplied with connective-tissue corpuscles. The

portion of the septa ensheathing the single lobules (Fig. 3, F) is but sparingly infiltrated with basis substance and exhibits the features of an early stage of development. This layer blends with the tissue of the central portion (Fig. 3, E). Here the elongated protoplasmic bodies are coarsely granular, indistinctly nucleated, whereas the fields of the basis substance still admit the recognition of the reticulated structure of the protoplasm and its composition by a number of bodies, greatly varying in size and shape. The central portion bears all the characteristic features of a myxomatous tissue, resembling that of the umbilical cord, although the connections of the elongated protoplasmic bodies are by no means as marked in the corpus luteum as they are in the tissue of the umbilical cord.

Based upon these researches, I maintain that the peripheral or lobular portion of the human corpus luteum of two months is

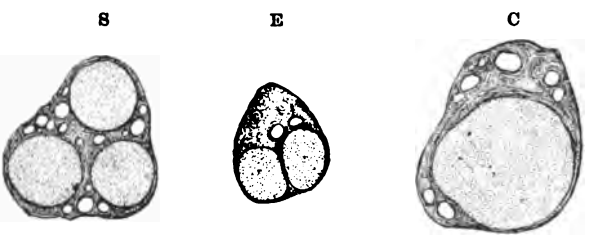


FIG. 4.—Cross-sections of ovaries with corpora lutea of pregnancy, natural size. S, ovary of sow; E, ovary of ewe; C, ovary of cow.

made up of embryonal or indifferent tissue. The central portion is further advanced in development to the formation of a myxomatous tissue. We have, therefore, a granulation tissue before us, as we see in the granuloma in the process of healing of a wound after loss of substance. The earliest stage of granulation tissue is that of indifference, the next that of the myxomatous type. The tissue filling a wound and that filling the burst Graafian follicle are identical.

With the knowledge obtained from the study of an early human corpus luteum, I will proceed to the analysis of the corpora lutea of animals, those of the sow, the ewe, and the cow. Fig. 4 represents such corpora lutea in cross-sections of the ovaries in natural size.

B. Corpus Luteum of the Sow.—The fertility of this animal is well illustrated by the three corpora lutea almost filling the substance of the ovary; what is left of the ovarian tissue is con-

spicuous by a number of cavities representing the so-called small cystic degeneration of the ovary. I here wish to state that all the cavities that honeycomb the ovary of the sow are Graafian follicles in different stages of development.

With low powers of the microscope we can ascertain that each corpus luteum is surrounded by a capsule of fibrous connective tissue, which at the most peripheral portions is identical with the capsule of the ovary itself. The capsule is freely supplied with arteries, veins, and capillaries. The latter varieties of ves-

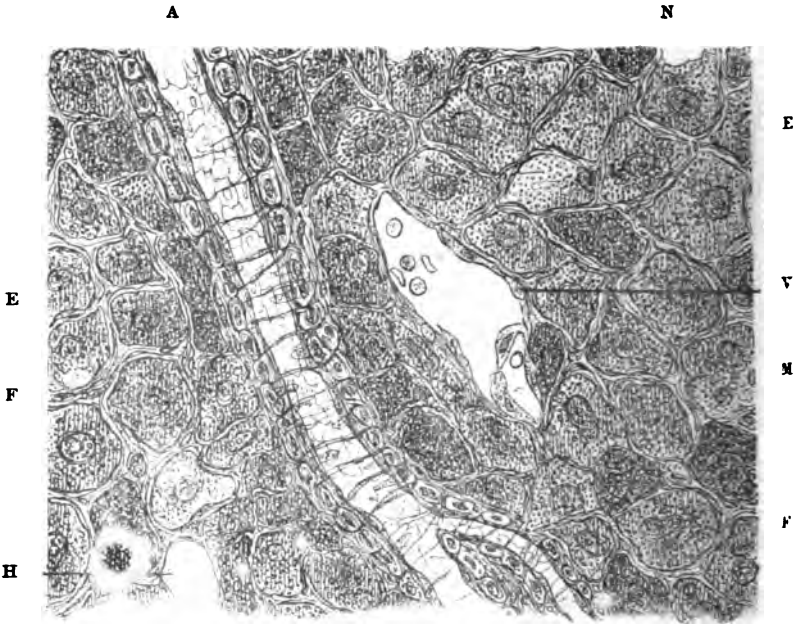


FIG. 5.—Fully developed corpus luteum of sow. × 500. A, artery; V, vein, with partly detached endothelia; E, E, endothelia filling the meshes of the fibrous connective tissue; N, vacuoled endothelium; F, F, fibrous connective tissue between the endothelia; H, empty space, the endothelium dropped out; M, endothelium composed of medullary corpuscles.

sels are often seen widened and taking a concentric course around the corpus luteum. The fibrous connective tissue sends scanty offshoots into the depth of the corpus luteum, accompanying the arteries and veins, but nowhere producing regular septa as in the human ovary. In fact, the blood supply of the corpus luteum of the sow is but scanty.

With medium powers of the microscope the corpus luteum of the sow yields the striking appearance presented in Fig. 5.

I have selected for illustration a portion traversed by an arte-

riole, which is accompanied by a delicate layer of fibrous connective tissue sending minute offshoots between the large protoplasmic bodies. The vein visible in the same field has only a narrow adventitial coat of fibrous connective tissue, but no muscle fibres in its wall. The most striking features are the bluntly polyhedral, protoplasmic bodies scattered almost uniformly throughout the corpus luteum. These bodies are conspicuous by a yellowish-brown color and the lack of ammoniacal carmine stain; they are coarsely granular, distinctly nucleated;

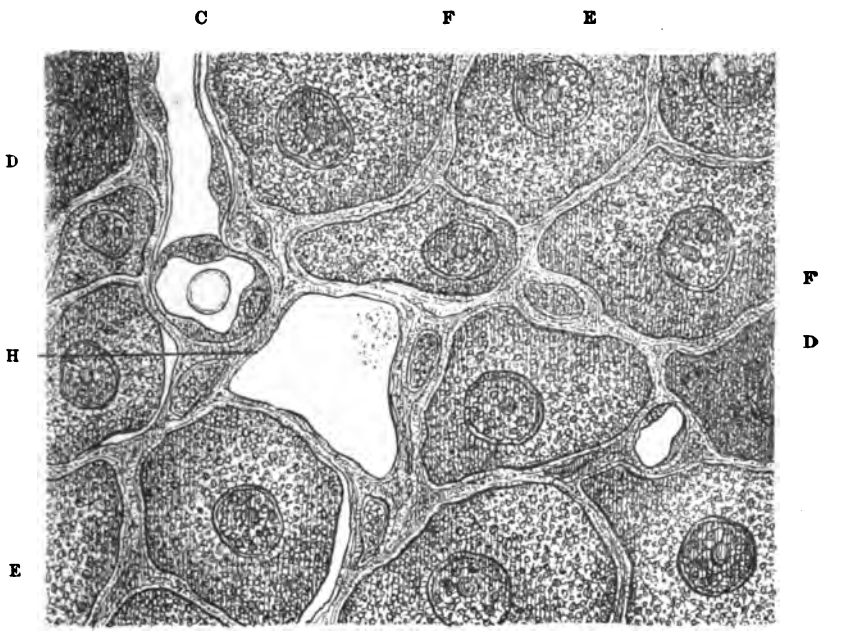


FIG. 6.—Fully developed corpus luteum of sow. × 1200. E, E, non-pigmented endothelia; D, D, pigmented endothelia; F, F, frame of delicate fibrous connective tissue; H, space left after dropping out of endothelium; C, capillary blood vessel.

the majority are pale, and only here and there we meet with dark-brown bodies. Not infrequently the body appears retracted from the adjacent connective-tissue sheath, whereby a light gap is produced. Occasionally such a body contains vacuoles, or the body may have dropped out from its sheath and left a light gap. Each corpuscle is surrounded by a delicate layer of fibrous connective tissue which has taken the carmine stain. This stain is especially pronounced in the protoplasmic formations lying in

the broadest portions of the sheath, the so-called connective-tissue corpuscles.

What are the protoplasmic bodies under consideration?

In order to settle this question we must resort to the highest powers of the microscope (see Fig. 6).

We are struck by the reticulated structure, which is seen in the nuclei as well as in the surrounding protoplasm. The nuclei are coarsely granular and bordered by a distinct shell in the majority of the bodies. They are sometimes located in the centre of the body, sometimes eccentrically. In the dark-brown bodies the nuclei are not globular, but irregularly shaped, often exhibiting indistinct karyokinetic figures (D D). The granules vary in size in the pale bodies, but are more uniform in size in the brown ones. All granules, it is immaterial whether in the nucleus or in the surrounding protoplasm, are united with one another by delicate, thorny offshoots. The stain so characteristic of the bodies under consideration is always diffuse, uniformly distributed in the granules of the protoplasm both in the pale and the dark bodies. The nuclei of the surrounding connective tissue are likewise granular, but differ from the large bodies by their carmine stain.

From what we have learned in the human corpus luteum we are justified in asserting, firstly, that each large body is the outcome of coalescence of a number of indifferent or medullary corpuscles; indications of such a splitting up are recognizable in Fig. 5, M. Secondly, we must term the large bodies endothelia, and not epithelial or epithelioid cells, since they are the offspring of indifferent corpuscles, all together of the type of connective-tissue formations. Thirdly, we admit that the brownish color of these endothelia is due to the hemoglobin dissolved out of the red blood corpuscles that have first filled the cavity left by the rupture of the Graafian follicle. The term lutein cells is applicable to the endothelia of the corpus luteum, although it has no proper sense.

In the history of development of the myxomatous tissue, more especially of the umbilical cord and the granuloma of healing wounds, we invariably notice the origin from indifferent corpuscles which have been infiltrated with a myxomatous basis substance. A number of such bodies are surrounded by unchanged protoplasmic bodies, branching and interconnecting, or by a network of delicate fibrous connective tissue which at the

points of intersection still retains a nucleus. If we say that the corpus luteum is composed of myxomatous tissue in which no infiltration with basis substance has taken place, but the protoplasmic condition has been retained indefinitely, I believe we have a proper definition of the tissue building up the corpus luteum.

The corpus luteum is a transient formation which attains full development during gestation and disappears after delivery. It

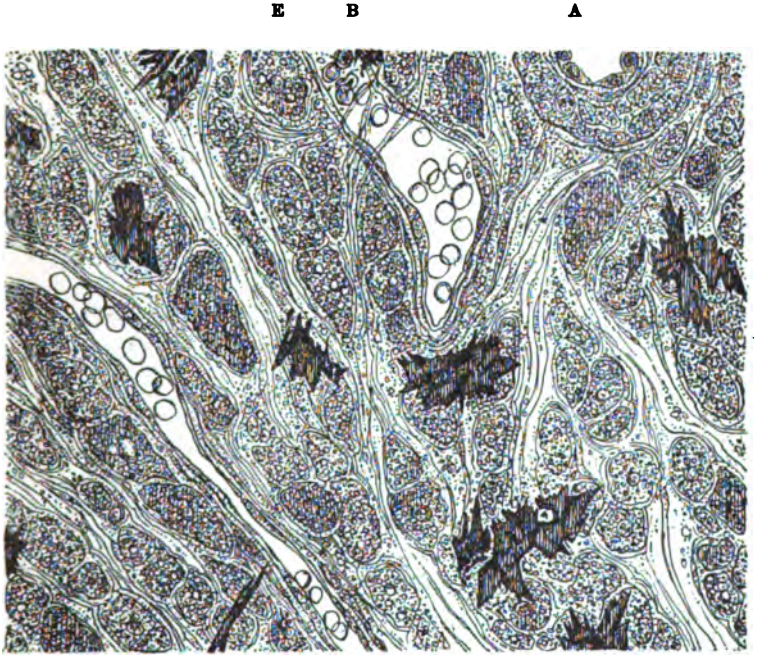


FIG. 7.—Corpus luteum of sow in involution. × 400. E, E, endothelia, partly coarsely a ı partly finely granular, all slightly pigmented; F, F, interstitial delicate fibrous connective tissue; H, H, hematoidin crystals; A, artery, the middle coat broken up to medullary corpuscles; C, capillary blood vessel; B, red blood corpuscles within a capillary, in beginning change to hematoidin.

is of considerable interest to trace the changes that are characteristic of the involution of the corpus luteum (see Fig. 7).

Whereas the latter is easily discernible with the naked eye, there is scarcely a possibility of recognizing a corpus luteum in involution except on account of a slight brownish discoloration. Under the microscope the most prominent feature is an abundance of rust-brown hematoidin crystals scattered both through-

out the corpus luteum and the connective tissue in the immediate vicinity. The pigmented, coarsely granular endothelia are still present, though much less in number and much smaller in size than in the corpus luteum at the full height of its development. The fibrous connective tissue, on the contrary, is far more abundant. There is but one possibility of explaining this change, and this is, a return of the endothelia into the embryonal state by breaking up into medullary or indifferent corpuscles, which split up into spindles and become fibrous connective tissue after infiltration with glue-yielding basis substance.

This assumption is justified by the study of the corpus luteum in involution. Each cluster of coarsely granular, diffusely pigmented bodies proves to be a remnant of a previous endothelium. At the same time a paling of the protoplasm has taken place, due to a decrease in the number of granules within the medullary corpuscles. Thus an originally coarsely granular and pigmented body is changed into a finely granular, non-pigmented one. Not only will this change facilitate the transformation into fibrous connective tissue, but also the absorption through the lymphatics, as the study of the senile changes of the connective tissue proves.

I wish to draw attention to the red blood corpuscles within a capillary blood vessel, depicted in Fig. 7, B. Here a few red blood corpuscles have taken up a dark yellow-brown color, and in them have appeared small, prismatic crystals of hematoidin. This occurrence explains one source of the hematoidin. Another source was found in the involuted corpus luteum in small hemorrhages scattered in the connective tissue. The extravasated blood certainly can assist in the production of hematoidin crystals. By a coalescence of prisms originate the peculiarly shaped rust-brown clusters of hematoidin so characteristic of the process of involution of the corpus luteum.

C. Corpus Luteum of the Ewe.—The naked-eye appearance (Fig. 4, E) is not essentially different from that of a sow's ovary, since here, too, we notice the brownish color, delicate rents due to blood vessels, but no lobulation whatever. With low powers of the microscope we can ascertain the fact that toward the periphery each corpus luteum is covered only by a thin connective-tissue capsule blending with that of the ovary itself. In one specimen I have seen a shallow depression on the surface of the ovary, corresponding to a slightly thickened knot of connec-

tive tissue, still crowded with protoplasmic bodies, from which the elongated endothelia and the blood vessels took a radiating course. Obviously this knot was the healed wound produced by the rupture of the Graafian follicle. The vascular supply of the capsule of the corpus luteum is more abundant than in the sow, though it must be conceded that the ewe's ovary contains far more blood vessels in its substance than that of the sow. Especially are the arteries and arterioles of the ewe's ovary conspicuous by beautifully developed smooth muscle fibres.

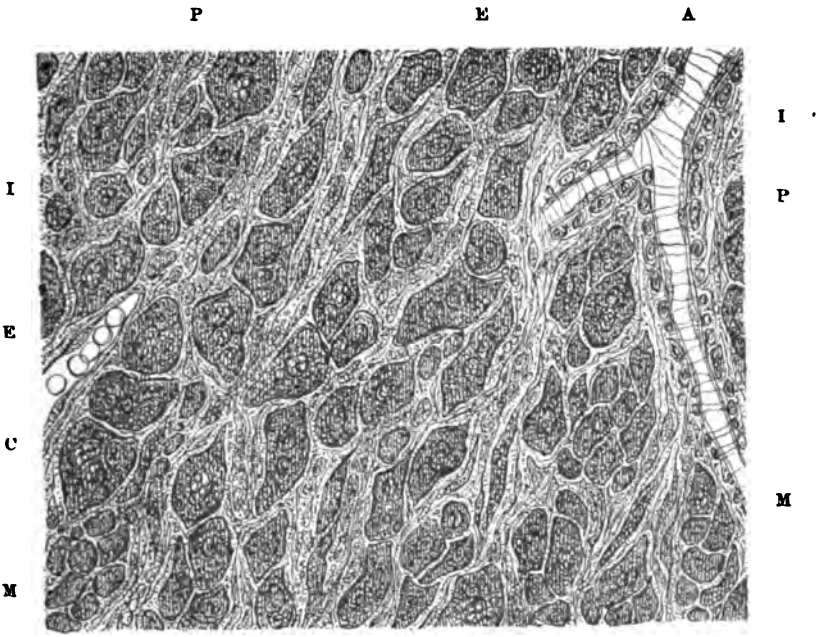


FIG. 8.—Fully developed corpus luteum of ewe. × 400. E, E, coarsely granular, diffusely pigmented endothelia; M, M, clusters of medullary corpuscles; I, I, interstitial connective tissue; P, P, protoplasmic bodies, partly pigmented, in the interstitial tissue; A, artery; C, capillary blood vessel.

With a power of about four hundred diameters the corpus luteum of the ewe has the following appearance (Fig. 8):

The endothelia are of a pronounced yellow-brown tint; they are much smaller than those of the sow; they often exhibit two or more nuclei, and are frequently found to be composed of medullary or embryonal corpuscles. Even single endothelia vary greatly in size and shape; often they are found elongated, particularly so at the spot of the previous rupture of the follicle.

The amount of fibrous connective tissue is far greater than in the sow, and this tissue carries a number of protoplasmic bodies, many of which are elongated and spindle-shaped, not admitting a thorough diagnosis, whether we have to place them among the endothelia or the connective-tissue corpuscles, since they often exhibit a yellow-brown pigmentation.

Of my specimens, four were obtained from pregnant ewes of about two months' term, and four from ewes some time after delivery.

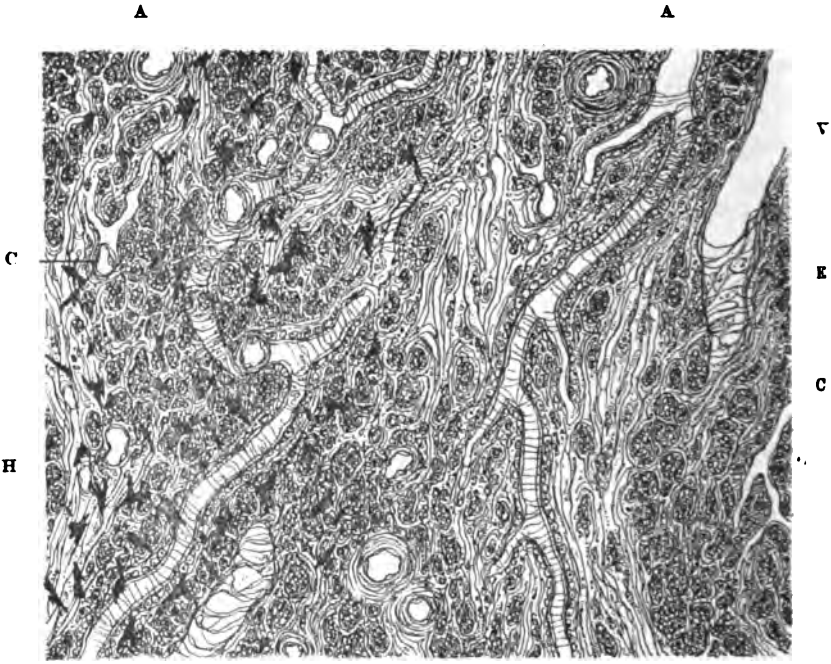


FIG. 9.—Corpus luteum of ewe in involution. × 200. H, portion of corpus luteum richly supplied with hematoidin crystals; E, portion of corpus luteum destitute of hematoidin crystals; A, A, arteries; V, vein; C, C, capillaries.

I can say that the total appearance of the tissue is more juvenile than in the sow, and corresponds to an earlier stage of development of the sow's corpus luteum. The vascular supply of the ewe's corpus luteum is somewhat richer than that of the sow.

With high powers we ascertain all features described in the sow's corpus luteum, as to the structure of the large protoplasmic bodies and their nuclei. The latter, however, often appear

as solid lumps or clusters of large, homogeneous, glossy granules. The process of involution of a corpus luteum of a previous pregnancy is similar to that of the sow (Fig. 9).

I have selected a low power for the representation of a corpus luteum, mainly to illustrate the fact that one portion may be crowded with hematoidin crystals, another entirely destitute of them. The crystals, therefore, are not an essential feature of the retrogressive metamorphosis of a corpus luteum. One of the sources of such crystals seems to be the pigmented endothelia themselves (H), since I have seen small rust-brown prisms embedded in single endothelia. The latter, though still coarsely granular, are on an average smaller than those of the fully developed corpus luteum, and their hue is paler. Obviously a reduction of many coarsely granular bodies has taken place into finely granular and non-pigmented bodies, with a final change into fibrous connective tissue. Small, finely granular bodies are seen embedded in large numbers within the fibrous tissue, not differing materially from ordinary connective-tissue corpuscles. They are recognizable by a slight yellow-brown tint as previous endothelia, only they are more crowded.

The delicate fibrous tissue is freely supplied with arterioles, veins, and capillaries, all of a more or less tortuous course, obviously due to the shrinkage of the bulk of the corpus luteum. Some of the veins are partly filled with a myxomatous tissue, due to a proliferation of the endothelia, and finally leading to the obliteration of the vessel. A similar process is noticeable in many capillary blood vessels that have been transformed into fibrous connective tissue. The arterioles, on the contrary, have not undergone changes in their constituent elements. The study of the vicinity of the shrivelled corpus luteum enables me to state that the final result of the involution is cicatricial, fibrous connective tissue.

D. Corpus Luteum of Cow.—With the naked eye we see (Fig. 4, C) a globular formation, indistinctly lobulated, of a considerable size. It is surrounded by a concentrically striated capsule, blending at the most peripheral portion with the capsule of the ovary. The rest of the ovary is pierced by cavities of varying size, which by closer analysis prove to be follicles in different stages of development.

Low powers show that the corpus luteum is traversed by fibrous septa running irregularly and carrying the blood vessels of

the three types. The vascular supply of the main mass is but scanty, that of the capsule, on the contrary, abundant. Only the tissue of the capsule and the septa emanating therefrom have taken the carmine stain, while the main mass lacks this stain and exhibits a yellow-brown color, nowhere of a deep tint. The main mass is composed of polyhedral, large-sized endothelia and a considerable amount of ensheathing fibrous tissue. The size of the endothelia is largest at the most peripheral portion, nearest to the previous rupture, where they ap-

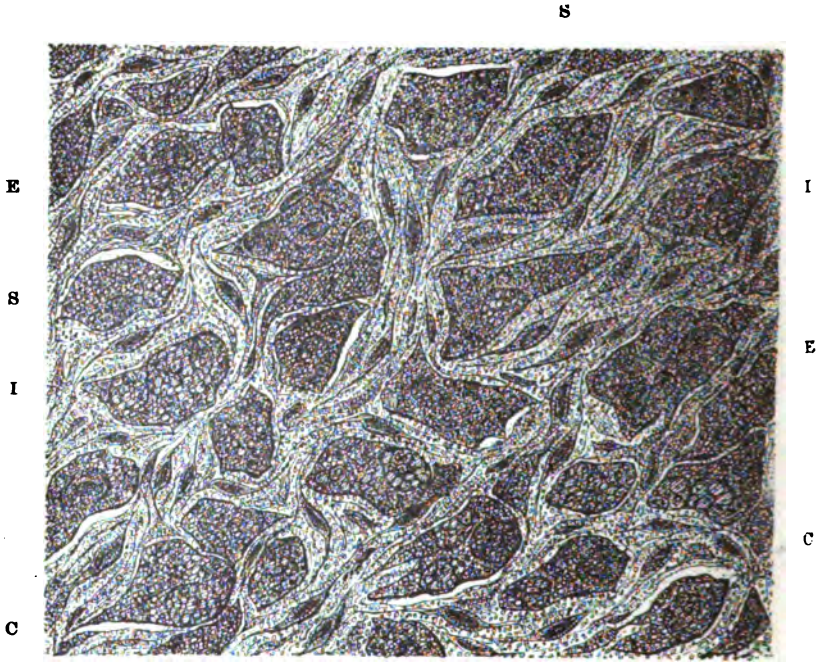


FIG. 10.—Fully developed corpus luteum of cow. × 400. E, E, coarsely granular, diffusely pigmented endothelia; I, I, interstitial connective tissue; S, S, spindle-shaped protoplasmic bodies; C, C, coarsely granular protoplasmic bodies slightly pigmented.

pear much elongated and take a radiating course toward the rupture. In the latter situation the capillaries are most numerous and conspicuous by their straight course. The appearance of the main mass is represented in Fig. 10.

We are struck at once by the large size and angular shape of the endothelia. Many of these have long, pointed offshoots, rendering them pear-shaped or triangular. Interspersed among the large endothelia we occasionally observe small ones, like-

wise of angular contours. The granulation in the protoplasm is apparent by its coarseness and variance in size. The nuclei are but indistinctly defined, also composed of coarse granules densely packed together. In some bodies two and more nuclei are traceable, in others none, either being really absent or merely concealed by the coarse granules of the protoplasm. The pigmentation is diffusely distributed throughout the granules of both protoplasm and nuclei.

The fibrous connective tissue which ensheathes the endothe-

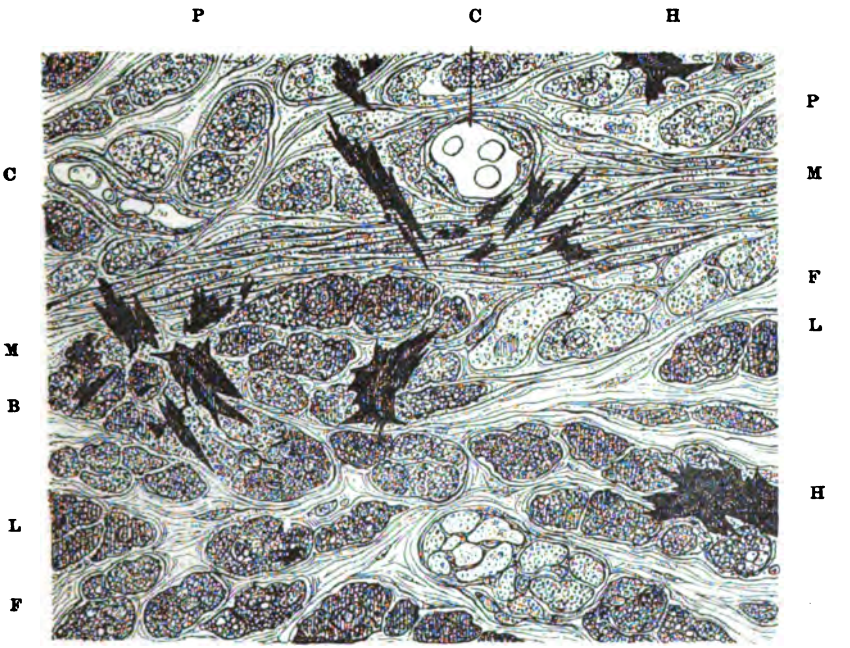


FIG. 11.—Corpus luteum of cow in involution. × 400. M, M, bundle of smooth muscle fibres; L, L, coarsely granular, pigmented endothelia (so-called lutein cells); P, P, almost pigmentless endothelia, with scattered granules; B, coarsely granular endothelium, showing the beginning formation of hematoidin; F, F, faintly striated interstitial connective tissue; H, H, crytals of hematoidin; C, C, capillary blood vessels.

lia is conspicuous by its abundance and the large number of spindle-shaped protoplasmic bodies or connective-tissue corpuscles. The fibrillation of this tissue is nowhere pronounced. The large amount of interstitial tissue, as compared with the corpora lutea of the sow and the ewe, and the variety of the size of the endothelia, indicate that the corpus luteum under consideration has really passed its full height of development

and has begun to enter retrograde changes. This coincides with the fact that the cow is usually slaughtered four to five months after delivery. We can justly assume, therefore, that the corpus luteum which we are studying is one in thirteen or fourteen months of its existence.

The process of involution is sometimes marked by an abundance of hematoidin—so much so that such a corpus luteum is recognizable to the naked eye by its rust-brown color. But I have met with corpora lutea in involution lacking hematoidin crystals altogether, so that I would reiterate my remark, made in the description of the ewe's ovary, that hematoidin is not an essential feature in the process of involution of a corpus luteum. The ordinary appearance of this formation is illustrated in Fig. 11.

The breaking up of the original endothelia into medullary or embryonal corpuscles is at once noticeable. The granules at the same time have become scantier and apparently less pigmented. The pigmentation has different degrees. Some medullary corpuscles are still yellow-brown, though comparatively few in number; in others the paling has attained such a degree that they do not differ from ordinary protoplasm; whereas some appear but finely granular, indistinctly nucleated, as if in the process of infiltration with basis substance. Here and there we meet with small fields of a myxomatous connective tissue, which fields may have taken origin from the obliteration of capillary and venous blood vessels.

The clusters of hematoidin crystals are large and many-shaped. Again I have been able to trace their origin from the coloring matter of coarsely granular medullary corpuscles (B), in which the granules assume a dark red-brown color before giving rise to hematoidin prisms. Such images are also seen at L, and further toward the lower centre of the figure.

In the illustrated portion a bundle of smooth muscle fibres is seen traversing the tissue of the corpus luteum (M, M). I have no right to maintain that the muscle fibres are newly formed, the less since they likewise contain clusters of hematoidin crystals. This feature renders it probable that we have a bundle of smooth muscle fibres before us which originally traversed the cortex of the ovary in the vicinity of the Graafian follicle, and has escaped changes in the process of new formation following the rupture.

Lastly, I wish to draw attention to the tissue changes that take place in the immediate vicinity of a corpus luteum in involution (Fig. 12).

The arteries are here conspicuous by their narrow calibre and the bulk of the middle coat. Obviously this coat has changed its original structure of smooth muscle fibres into a delicate myxomatous tissue, as best illustrated in the cross-section of an artery (A), where the radiating fibres of the smooth muscle ought to be seen. In Fig. 7, A, I have drawn a cross-section of

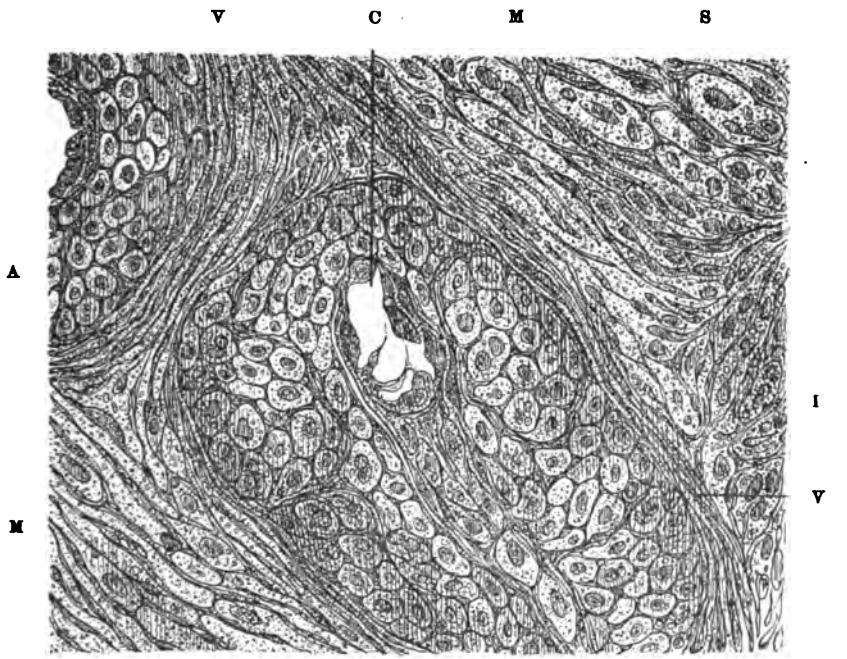


FIG. 12.—Tissue changes around a cow's corpus luteum in involution. × 400. A, artery in transverse section, the muscle coat transformed into myxomatous tissue; C calibre of an artery in oblique section, the endothelia in proliferation; V, V, adventitial coat of the artery; M, M, myxofibrous connective tissue; I, medullary tissue; S, remnants of smooth muscle fibres.

an artery in an involuted corpus luteum of the sow, where the smooth muscles are broken up into small medullary corpuscles. From this embryonal tissue evidently develops the myxomatous tissue forming the middle coat of the artery in Fig. 12. The artery C shows a beginning proliferation of the endothelia lining its calibre, the result of which is the appearance of a first embryonal, afterward myxomatous tissue, which

obliterates the calibre to complete impermeability. A similar change takes place in many veins, as mentioned before, yielding a myxomatous tissue in place of obliterated veins. Both the adventitial coat of the arteries and the tissue bordering on the disappearing corpus luteum are of a tissue variety best defined as myxofibrous, since in the meshes of the network of the delicate fibres myxomatous basis substance is deposited. The residues of smooth muscle fibres are likewise embedded in, and surrounded by, a myxomatous and myxofibrous reticulum.

These latter varieties of tissue, together with newly formed fibrous connective tissue, establish the comparatively small cicatrix, the last outcome of a previous corpus luteum of pregnancy.

The results of my comparative studies of the corpus luteum I would sum up in the following paragraphs:

1. The corpus luteum is a new formation of tissue, filling the loss of substance after the rupture of a Graafian follicle and fructification of the ovum.

2. In its production not only the wall of the ruptured follicle, but also the tissue of the ovary next to the follicle, and probably the remnants of the follicular epithelium, participate; thus the corpus luteum is considerably larger than the space occupied by the original follicle.

3. The corpus luteum is, in its earliest stages of development, of an embryonal or medullary or indifferent tissue, similar to that of the embryo in the first weeks of its growth.

4. The medullary tissue is the outcome of changes identical with those termed inflammatory. Fibrous connective tissue, smooth muscle fibres, and blood vessels break up by proliferation of their living matter, both of the protoplasm and basis substance, into indifferent corpuscles, united among themselves, representing the embryonal tissue.

5. The human corpus luteum of the second month of pregnancy is composed of a lobulated, cortical portion of embryonal and a central portion of myxomatous tissue. The corpora lutea of the sow, the ewe, and the cow are non-lobular and uniform in structure throughout.

6. The medullary elements, originally arranged in groups, produce by coalescence large, nucleated, protoplasmic bodies, the lutein or epithelioid cells of authors. They are pigmented by the hemoglobin of the extravasated blood corpuscles first filling the cavity of the ruptured follicle.

7. The large, coarsely granular, protoplasmic bodies should be termed "endothelia," and the tissue building up the corpus luteum "endothelioma"—*i.e.*, myxomatous tissue, in which the protoplasmic bodies persist instead of being infiltrated with basis substance.

8. The tissue of the corpus luteum is similar to that of a granuloma. The former is the result of a physiological, the latter a pathological reparative process. Both are myxomatous tissue.

9. In the corpus luteum the meshes of the myxomatous tissue remain throughout its persistence protoplasmic in the shape of coarsely granular, nucleated bodies, the endothelia. In the granuloma the meshes are soon infiltrated with myxomatous basis substance.

10. In the process of involution of the corpus luteum the endothelia break up into medullary corpuscles, which build up fibrous connective tissue. This process is often, but not invariably, accompanied by the appearance of clusters of hematoidin crystals.

11. The hematoidin crystals have a threefold source: red blood corpuscles contained in partly obliterated blood vessels; small extravasations of blood in the retrogressive changes of the venous and capillary blood vessels of the corpus luteum; and, lastly, the endothelia themselves, saturated with hemoglobin from their very origin.

12. The final result of the involution of the corpus luteum is cicatricial tissue, built up first by myxomatous, later myxofibrous, and at last by fibrous connective tissue.

39 WEST 52D STREET.

THE MECHANISM OF LABOR; SOME EXPERIMENTAL AND CLINICAL OBSERVATIONS.[1]

BY

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New York City.

(With one illustration).

THE writer believes that an intelligent and intimate knowledge of the mechanism of labor is as essential for the man-

[1] Candidate's paper for admission to the American Gynecological Society, May, 1893.

agement of normal and abnormal parturition as is an acquaintance with the anatomy and physiology of the heart for the treatment of functional and organic disease of that organ.

It has been with the object of inquiring more definitely into certain more or less unsettled questions that the following experimental and clinical observations have been made during the past year by the writer.

1. *What is the Cause of Internal and Forward Rotation of the Occiput in Vertex Presentations during Labor?*

The ischial spine, forming, as it does, the commencement of the smooth anterior inclined plane of the ischium, may, it is true, prevent the posterior rotation of the occiput in the first (L. O. A.) and second (R. O. A.) positions of the vertex, and even favor anterior rotation; but that they have anything to do with anterior rotation of the vertex in originally posterior positions it is difficult to understand.

All explanations of internal rotation, apart from the fetus, may be classed as (1) uterine and (2) pelvic.

The uterine theory attributes a rotation force to the uterus itself; the trunk and, secondarily, the head rotate to the front, because, after the escape of the liquor amnii, the uterus flattens and directs the dorsal plane of the fetus in that direction.

The pelvic explanation takes into account the shape of the pelvis—as determined by the ischial spines and planes and varying lengths of the pelvic diameters—and the shape, resistance, and action of the structures going to make up the perineal floor.

The anatomical investigations of J. Veit[1] and H. Varnier[2] deny to the shape of the pelvis—namely, the varying lengths of the various planes—and even to the bones of the pelvic outlet, every influence on the internal rotation of the head. The latter explains the rotation of the head exclusively as due to the arrangement of the muscles of the pelvic floor and the perineum.

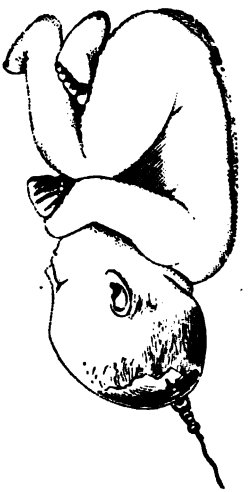
On the other hand, there is an interesting reported[3] case of labor in a woman after Kraske's operation for cancer of the rectum, where, in spite of the absence of the sacrum and of part of the ligaments and muscles making up the pelvic floor, in giving birth to a living child weighing nine pounds forward

[1] "Die Anatomie des Beckens im Hinblick auf den Mech. d. Geb.," 1887.
[2] "Du dedroit intérieur musculaire du Basin obstétrical," Paris, 1888.
[3] Lihotzhy, Montreal Medical Journal, June, 1889.

rotation of the occiput was observed and otherwise the mechanism of labor was normal.

In reply to the statement of Olshausen that internal rotation of the head is caused only by the co-rotation of the child's trunk, Zweifel[1] says: "We cannot agree with this doctrine. . . . We will only refer here to the first Braune section (Plate C), where the rotation of the head is already far advanced, the body still remaining completely transverse."

Desiring to test for himself, experimentally, the part the pelvic floor plays in anterior rotation of the presenting part, the writer undertook the following experiments.



Fortunately a cadaver was secured from the morgue in April, 1892, in the most favorable condition for the purpose.

It was that of a German girl, 20 years of age, who one morning was found upon the floor of her employer's store, dead from post-partum hemorrhage. The pregnancy had been a twin one, and, when found, one twin, rather small even for a twin, was found between the girl's thighs, and the remaining one, with the double placenta, was still within the uterine cavity. The cadaver was removed from the morgue to the operative surgery room of the University Medical College, and a careful examination failed to reveal any lacerations of the cervix, vagina, or perineum. Hence one of the first conditions of success

[1] "Lehrbuch der Geburtshülfe," Stuttgart, 1892.

—a firm perineum—was obtained. A fetal cadaver was selected of average size, the sagittal suture opened, the occipital bone incised for half an inch, and, after firmly fixing the swivel and ring seen in the accompanying cut at a point one-half inch posterior to the small fontanelle, the scalp was closed by sutures. To the ring of the swivel was then tied a yard of whipcord.

In making use of the term complete rotation of either head or shoulders in these observations, it is not meant that mathematically complete rotation resulted, but only such as palpation or inspection determined, unaided by more exact means of measurement. Leishman's researches with a cord stretched from symphysis to coccyx showed that exact coincidence of the sagittal suture and the antero-posterior diameter of the pelvic outlet failed in many instances. The well-known experiments of Paul Dubois consisted in *pushing* fetal cadavers of various sizes through the birth canal of a puerpera recently dead. The following experiments, as will be readily seen, differ somewhat from the above, in that *traction* is made directly on the occiput and the head permitted to revolve at will on a swivel.

The abdomen and uterus of the cadaver being now opened, and the uterus held in as nearly a normal position as possible —including the usual right lateral obliquity and left to right torsion—the experiments were then made.

Experiment I.—The whipcord, by means of a pair of uterine dressing forceps, was passed down from above through the cervix, vagina, and out at the vulva, and the fetal cadaver placed in its normal attitude within the uterus in the L. O. A. position.

Traction, intermittent in character, upon the cord in the vagina, and always in the axis of that part of the pelvis at which the vertex rested, caused descent of the head until the pelvic floor was reached or until the occiput reached a point just below the ischial spines, and then forward rotation of the occiput brought the sagittal suture into the antero-posterior diameter of the pelvic outlet. The head was not delivered. The shoulders were now found just at the brim, with the bisacromial diameter, as originally placed, corresponding to the left oblique diameter of that part of the pelvis.

Experiment II.—Anterior rotation was secured in the R. O. A. position in the same manner, the shoulders coming to the brim in the right oblique diameter.

EXPERIMENTS III. AND IV.—Experiments I. and II. repeated, with the same results.

EXPERIMENT V.—Fetus placed in normal attitude in the R. O. P. position, and anterior rotation about the right half of the pelvis occurred, the small fontanelle finally resting just below the subpubic ligament. Now for the first time the head was drawn through the vulva, and the mechanism of shoulder delivery watched. The bisacromial diameter entered the brim in the left oblique diameter, the left shoulder being lowest and to the front of the pelvis. Upon the sagittal suture becoming transverse the shoulders began to rotate, and finally brought the bisacromial diameter into the opposite or right oblique, the small fontanelle being now at the subpubic ligament.

EXPERIMENT VI.—Vertex placed in the L. O. P. position in the lower uterine segment. Anterior rotation of the occiput about the left side of the pelvis took place as soon as the pelvic floor was reached, until the occiput came to the pubic arch; upon delivery of the head internal rotation of the shoulders, and finally of the buttocks, was observed.

EXPERIMENT VII.—The occiput was now placed directly in the median line of the body and just under the promontory of the sacrum. Traction on the cord, as before, readily brought the well-flexed head to the pelvic floor. Further progress now was arrested for a moment. Intermittent traction, however, being continued, finally, slowly and gradually by means of palpation, rotation of the head was observed to take place about the right half of the pelvis, until at last, as before, the small fontanelle appeared at the ligamentum arcuatum, the vertex having traversed a complete semicircle. Anterior rotation in this instance was only secured after persistent and repeated traction with the swivelled cord, and was only finally attained after considerable bulging of the tissue included between the coccyx and fourchette was produced by the advancing and rotating head.

The writer feels convinced that the preceding experiments were fair tests; that by using care to make traction on the cord only in the axis of that part of the parturient canal in which the presenting part rested, the influence of the traction upon the vertex did not favor forward rotation *per se*, but only by downward traction did it bring the head in relation with influences favorable to the rotation of the head on the swivel.

The shoulders being originally in the transverse diameter of the brim in this experiment, it was observed that during the tardy anterior movement of the occiput the shoulders moved from the transverse into the left oblique and then into the conjugate, and, during the dragging of the head through the vulva, into the right oblique diameter of the pelvis, and here shoulder rotation ceased and they passed obliquely through the vulval opening.

EXPERIMENT VIII.—Once more the fetal head was placed, well flexed, in the L. O. A. position at the brim, and, upon traction bringing the occiput into the lower half of the pelvis, little if any rotation of the head could be detected, the head being dragged through the vulval slit obliquely, and no attempt at rotation on the part of the shoulders was noticed.

EXPERIMENT IX.—R. O. A. position. Result same as in Experiment VIII.

EXPERIMENT X.—Head placed as before in R. O. P. position. The head was drawn to pelvic floor and through vulva in this position, the shoulders also preserving their original position in the left oblique diameter and were so dragged through the outlet.

EXPERIMENT XI.—L. O. P. position. Result same as in Experiment X.

EXPERIMENT XII.—Head placed flexed as in Experiment VII. Not even the slightest change from the original position could be observed, the occiput, still posterior, being dragged over the perineum, and the shoulders remaining in their original transverse position.

Such experiments can, of course, determine nothing as to the influence of forward rotation of the fetal trunk upon anterior rotation of the occiput. In other words, they fail entirely to show us what factor the rotary power attributed to the uterus plays in the production of movements of the occiput. Undoubtedly during pregnancy and the early stages of labor the position, shape, and contractions of the uterus play an all-important part in the production of the normal attitude, presentation, and position of the fetus; but that these factors, with the exception of uterine contractions, are at all essential to the movements of the occiput the writer does not believe. Rotation of the head does without question occur independently of the body, as has been observed by many (Frommel, Schatz), and as can be seen by

reference to Braune's frozen sections (Plate C). The influence of trunk rotation over cephalic is shown in the well-known clinical fact that the lateral posture of the parturient, right or left as the case may demand, does undoubtedly assist anterior occipital rotation in occipito-posterior positions and tardy rotation in original occipito-anterior positions. This the writer has, in a number of cases, been able to demonstrate to the pupil at the bedside.

What these experiments do demonstrate, however, is that the pelvic-floor explanation of rotation of the most dependent portion of the presenting part is a sufficient one.

Rotation is complete and readily accomplished in the first of the above-mentioned trials; then, as the muscles and tissues become more and more stretched and relaxed as the result of repeated pressure upon them, we find rotation first incomplete and finally failing to occur altogether.

The subsequent clinical observations are in accord with the foregoing. In the forty-seven primiparæ we see internal forward rotation of the occiput failing in only seven instances; in the forty-three multiparæ we observe failure in thirty. Given the normal attitude of the fetus (extreme flexion of the head) and good expulsive powers, and the most important remaining condition for forward rotation and a normal mechanism is a *firm pelvic floor.*

2. *Internal Rotation of the Head, and Head Delivery.*—Observations were made at the bedside upon forty-seven primiparæ and forty-three multiparæ, during spontaneous labor at term, in various positions of the vertex.

PRIMIPARÆ (47 OBSERVATIONS).

Complete forward rotation of occiput	40 cases
Incomplete " " "	7 "
Total	47 "

Complete rotation once in 1.1 cases.

MULTIPARÆ (43 OBSERVATIONS).

Complete forward rotation of occiput	13 cases
Incomplete " " "	30 "
Total	43 "

Complete rotation once in 3.3 cases.

The results show that internal rotation of the head was complete before it entered the vulval slit in forty of the forty-

seven observations in primiparæ, and in only thirteen of the forty-three of multiparæ, thus showing that complete internal rotation of the occiput in vertex presentations occurs 1 : 1.1 in primiparæ, as against 1 : 3.3 in multiparæ; or, in other words, the emergence of the sagittal suture at the ostium vaginæ in an oblique diameter of the pelvis is three times as common in multiparæ as in primiparæ. This fact, it seems to the writer, can only be due to the greater firmness and rigidity of the pelvic-floor tissues in the primipara over those of the multipara.

One of the seven primiparæ in whom anterior rotation of the vertex failed was a Hungarian, 20 years old. The position was L. O. A.; the dorsal posture was used during delivery; no chloroform or ether; duration of labor, twenty-five hours; of second stage, one hour and forty minutes. The birth of the head in an oblique diameter resulted in a bilateral laceration of the vagina; the perineum proper was not ruptured. Internal rotation of the shoulders occurred spontaneously, the perineal shoulder appearing first and being first delivered by traction in the axilla. In a second instance the woman was Irish, 25 years old; the position R. O. P.; the posture during second stage, dorsal; duration of labor, eight hours; of second stage, three hours; chloroform was used; forceps finally applied, and the birth of the head obliquely caused deep vaginal and perineal laceration into the rectum. The true conjugate in this case was under four inches. This was the only complete perineal laceration occurring among seventy-two primiparæ and seventy-nine multiparæ of whom records were kept.

Not uncommonly in old multiparæ with lax soft parts one observes what may be termed a deep transverse position of the sagittal suture—namely, the head advances through the lower part of the pelvis, and even up to the orifice of the vulva, in a transverse or oblique position, and internal rotation only occurs at the very last moment in the vulval orifice, becomes incomplete or fails altogether, because the strength and rigidity of the primiparous pelvic floor is wanting in the multiparous. On the other hand, we sometimes see excessive internal rotation of the head, by which we mean the sagittal suture rotates from one oblique pelvic diameter past the conjugate and into the opposite oblique. This is probably in consequence of excessive rotation of the trunk, due to strong uterine contractions compressing the fetal back and turning it toward the front and opposite side.

In sixty-nine observations on primiparæ and seventy-one on multiparæ excessive rotation of the head from one oblique diameter to the other occurred in but one instance—a primipara.

The writer's observations show that in sixty-nine vertex presentations in primiparæ, including the various positions, in only one instance did a permanent occipito-posterior position obtain. This woman had a true conjugate of less than four inches, and was finally delivered in the presence of the writer by forceps, the sagittal suture being born in an oblique diameter, and with an entire loss of the perineal structures (case referred to above).

In seventy-one vertex presentations in multiparæ, including various positions, anterior rotation failed in three instances.

Head Delivery.—An attempt was made to test the truth of the statement of Dr. D. Berry Hart[1] that the term "extension of the head," as applied to the mechanism of head delivery in vertex anterior positions, is a most misleading one, for it indicates that the chin leaves the sternum while the head is passing the perineum.

He states: "I deny *in toto* that the chin leaves the sternum, and I hold that this fixation of the occiput and descent of the sinciput is not the best or normal mechanism. The best mechanism to avoid tear is for the occiput to lead, for the head to be driven on by a steady movement of translation, any rotation upon a biparietal axis so taking place as to favor occipital dipping and never dipping of the sinciput. It is easy to see how the erroneous idea of extension arose. The attendant, while the patient lay on her left side, watched the passage of the fetal head from behind, saw more of the anterior portions of the head appear, and accounted for it by extension."

In a limited number of spontaneous vertex deliveries at term, by the administration of chloroform to control the rapidity of the passage of the head, and by repeated rectal and vaginal palpation, the latter more especially in multiparæ, the writer has been able to demonstrate to the satisfaction of those present that the chin does not, under the above conditions, leave the sternum until the bulk of the head, including what may be termed the suboccipito-frontal diameter, has escaped from the vulval orifice. The small number of observations, however, forbids any conclusions.

3. *Internal Rotation of the Shoulders, and Shoulder Delivery.*—Observations were made upon sixty-seven primiparæ and

[1] Transactions Edinburgh Obstet. Soc., vol. xii., 1887.

seventy multiparæ as regards the internal rotation of the bis-acromial diameter, as follows:

PRIMIPARÆ (67 OBSERVATIONS).

Complete rotation of shoulders into antero-posterior diameter of outlet before delivery	51 cases
Incomplete delivery in oblique diameter	14 "
" " " transverse "	2 "
Total	67 "

Complete rotation once in 1.3 cases.

MULTIPARÆ (70 OBSERVATIONS).

Complete rotation	56 cases
Incomplete "	14 "
Total	70 "

Complete rotation once in 1.2 cases.

It will be seen from the above that complete rotation occurs with about equal frequency in primiparæ and multiparæ.

Regarding shoulder delivery the following was observed:

Shoulder first to appear in the vulva:

PRIMIPARÆ (69 OBSERVATIONS OF SPONTANEOUS DELIVERY).

The perineal or posterior shoulder appeared first in the vulval orifice in	33 cases
The pubic or anterior first in	33 "
Both shoulders simultaneously	3 "
Total	69 "

Posterior shoulder once in 2.09 cases.

MULTIPARÆ (68 OBSERVATIONS OF SPONTANEOUS DELIVERY).

Perineal shoulder first in	43 cases
Pubic " " "	25 "
Total	68 "

Posterior shoulder once in 1.5 cases.

Shoulder first to be delivered:

PRIMIPARÆ (15 OBSERVATIONS OF SPONTANEOUS DELIVERY).

Perineal shoulder first born in	9 cases
Pubic " " " "	3 "
Simultaneous delivery in	2 "
Transversely in	1 "
Total	15 "

MULTIPARÆ (28 OBSERVATIONS OF SPONTANEOUS DELIVERY).

Perineal shoulder first born in	19 cases
Pubic " " " "	8 "
Simultaneous delivery in	1 "
Total	28 "

From the foregoing it would appear that the posterior shoulder is born first three times as often as the anterior in primiparæ, and two and a half times as often in multiparæ.

It must be remembered, however, that in almost every one of the above cases the head upon delivery was lightly supported with the hand; this support results in favoring the birth of the posterior shoulder first.

R. Lefour believes the posterior shoulder, as a rule, is born first.

Auvard found in twenty-nine cases the posterior shoulder came first in sixteen and the anterior in nine cases.

He recommends in all cases support of the head, in order to prevent its own weight interfering with the natural progress of the expulsion of the body.

Before attempting to extract the shoulders they should have completely rotated, and, if possible, should be expelled by a *vis a tergo*, at the same time so assisting as to carry the anterior shoulder well up behind the symphysis. By so doing we facilitate delivery of the posterior arm, which is the safest and most natural method of delivery.

The same principle may be applied to the after-coming head. By means of the foregoing manipulation we secure what may be termed the "cervico-acromial" diameter of the fetus at the outlet instead of the bisacromial.

Leonet asserts that the anterior shoulder first disengages in ninety out of one hundred cases if the fetal head be not supported; that the posterior shoulder first emerges in ninety out of one hundred cases if the head be supported. He states that the danger to the perineum first begins upon the disengagement of the posterior shoulder.

The posture of the woman does not appear to affect the mechanism of shoulder delivery. Thus:

PRIMIPARÆ (15 OBSERVATIONS OF SPONTANEOUS DELIVERY).

Dorsal posture (9 cases):	
Posterior shoulder first delivered	4 cases
Anterior " " "	2 "
Simultaneous delivery	2 "
" " transverse	1 "
Total	9 "

Lateral posture (6 cases):

Posterior shoulder first delivered	4 cases
Anterior " " "	1 "
Simultaneous delivery (transverse)	1 "
Total	6 "

MULTIPARÆ (38 OBSERVATIONS OF SPONTANEOUS DELIVERY).

Dorsal posture (15 cases):

Posterior shoulder first delivered	9 cases
Anterior " " "	6 "
Total	15 "

Lateral posture (13 cases):

Posterior shoulder first delivered	10 cases
Anterior " " "	2 "
Simultaneous delivery	1 "
Total	13 "

4. *Injury to the Perineum.*—Nineteen perineal lacerations in primiparæ, including all degrees of injury, but no complete laceration, and in cases where complete shoulder rotation occurred, were caused as follows:

By forecoming head	8
By shoulder	6
Cause unobserved	5
Total	19

Whether the lacerations attributed to the shoulder as a cause were originated by the head within the vulva and completed by the posterior shoulder does not appear.

The dorsal posture was used during the second stage in sixteen cases, the lateral in three; chloroform in twelve instances; various means of perineal protection made use of.

The method of shoulder delivery giving by far the best results in the avoidance of injury to the soft parts is the one already referred to, in which delivery of the posterior shoulder first is favored by pushing the anterior shoulder behind the symphysis, thus obtaining the "cervico-acromial" diameter at the outlet and the *slow* delivery of the perineal shoulder.

Conclusions.—1. The chief factor in determining anterior rotation of the lowest portion of the presenting part is the resistance of the pelvic floor.

2. Complete forward rotation of the presenting part is the rule in primiparæ; it often fails in multiparæ.

3. Excessive rotation of the head is a rare condition.

4. A permanent occipito-posterior position is more common in multiparæ than in primiparæ, other things being equal.

5. Complete shoulder rotation occurs with about equal frequency in primiparæ and multiparæ.

6. In primiparæ and spontaneous delivery the anterior and posterior shoulders appear with about equal frequency.

7. In multiparæ and spontaneous delivery the posterior shoulder appears first more frequently than the anterior.

8. In spontaneous delivery the posterior shoulder is born first most frequently in both primiparæ and multiparæ—three times as frequent as the anterior in primiparæ, two and a half times as frequent in multiparæ.

9. The posture of the parturient does not appear to affect the mechanism of shoulder delivery.

10. Manual extraction of the shoulders was found to increase the percentage of perineal lacerations.

115 East 85th street, New York City.

REMOVAL OF OVARIES AND TUBES IN THE INSANE AND NEUROTIC.[1]

BY

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It is not only my privilege but my duty to express the appreciation and obligation I feel in being invited to present a topic before a society which, I think I may say without raising a shadow of opposition, is the most exclusive and erudite body of medical men in Chicago.

In looking over the general topic of the relations between the genito-urinary apparatus of women and nervous diseases, I found a field so broad that I was appalled at the prospect of any attempt to present the matter within the limits of one evening, and after considerable thought I decided to concentrate the sub-

[1] Read before the Gynecological Society of Chicago, May 19th, 1898.

ject by asking you to agree with me to a certain number of propositions which are practically axiomatic, and thereby fix attention, and I trust discussion, upon a major theme.

I believe that there is essential harmony among all concerned regarding the desirability of operating upon insane and nervous women for those conditions which demand operative interference, where mental and nervous disease is not in the field. Lately, however, neurological special and periodical literature and that of gynecology have been somewhat burdened with reported operations of ovarectomy or castration as a *per se* therapeutic measure in the mental and nervous diseases of women. The statement has been made, without much qualification, that there are hosts of women in hospitals for the insane who are deprived of operative treatment and are thereby consigned to the oblivion of insanity without hope of recovery. On the other hand, there are extremists who insist that gynecological interference in mental diseases is absolutely useless. I have no doubt the middle ground is the one to be here taken, as in every other situation.

What I desire to call to your attention particularly is the question of the desirability, where there are no underlying pathological changes in the organs of the pelvis clinically discoverable, of the operation of removal of the tubes and ovaries as a so-called curative measure in the graver neuroses—namely, insanity, hysteria of the major type, and epilepsy. I feel that the ordinary neuroses will never call for an operation of this magnitude and severity.

In discussing this matter I wish to call to your mind a series of cases, eighteen in number, recently presented by Dr. George H. Rohé before the American Association of Obstetricians and Gynecologists, in which he removed the ovaries and tubes in insane women for conditions, some of them trifling, in others where no disorder of a pathological nature could be suspected by a previous clinical examination. These cases are selected because they conform fairly, as far as results and conditions are concerned, to many other similar operations, and particularly because they have been made the basis of subsequent reports and references in various directions. In all these cases the ovaries and tubes were removed.

The operator made an examination of thirty-five insane women, and in twenty-six cases discovered what he termed dis-

ease of the ovaries and tubes. The diseases, as he has noted them in his rather incomplete report, consist for the most part of trifling conditions—at least they are trifling to my mind when compared with the magnitude of the operation, such as "enlargement," "ovarian adhesions," "tortuous tubes," "atrophic ovaries," "ovaries enlarged and cystic," and "various adhesions." I wish in this connection to call your attention to the fact that a great deal of weight is attributed to tortuosity in ovarian tubes, and, I believe, unjustly in many cases, because there is no question that many instances of tortuous and convoluted tubes are found post mortem or in operation in which symptoms could not be attributed to them and had never appeared in the clinical history. In many lower forms of animal life and in the human embryo the oviduct is a convoluted tube. I think, therefore, that the statement that a tube is convoluted should have very little weight, and may be simply a persistent embryological condition.

The first six cases reported by Rohé he denominates melancholia. The result in these six cases was slight improvement in five and no improvement in one. I bespeak your attention rather emphatically to the conditions, aside from this operation, which may have led to the change denominated by him "slight improvement." All of these cases had existed in a state of mental disturbance for such a long period of time as would justify one in calling them cases of a chronic nature. If any one thing is agreed upon by alienists, it is the fact that after mental diseases become chronic the most important element of treatment, and the one that leads to the best results therapeutically, is a change of environment, and a mental, moral, or physical shock sometimes is capable of producing immense benefit. Therefore I undertake to say that if these patients had been subjected to the same care, solicitude, attention, change, and watchfulness, without operation, as they received under it, there might have been secured as much improvement as followed this heroic treatment.

One case of simple mania in which he found difficulty from adhesions, and in which both tubes and ovaries were removed, presented no improvement.

In four cases of puerperal mania—which is essentially a septic state and might naturally be expected to lead to conditions demanding interference of this sort—he reports two recoveries

after two and six months respectively, and slight improvement in the other cases. Contrast these results with the fact that a very large proportion of cases of acute puerperal insanity get well if let alone. I think I am within the range of facts when I state that sixty per cent of these acute cases of puerperal insanity get well in from six to nine months under ordinary asylum care; yet after this heroic operation only two cases got well, and then after a period which might have marked the cases had no operation been done.

He reports a case of so-called hypochondriacal mania where both ovaries were removed with "slight improvement"; two cases of periodic insanity which presented a rhythm consentaneous with the menstrual flow, and here the removal of what he calls "cystic ovaries" produced no improvement whatever; one case of hystero-epilepsy in which the convulsive attacks usually occurred at the menstrual period, and in which he found one ovary "enlarged and cystic," and which, without other description, he reports as a recovery. In three cases of epilepsy he had two deaths, due to sepsis that was undoubtedly attributable to a pre-existent trouble in the pelvis and in no wise to the operation.

Therefore, out of sixteen cases, omitting the two cases of epilepsy with fatal issue, three cases showed no considerable improvement, there were two recoveries in puerperal insanity and one recovery in hystero-epilepsy. If we bear in mind the fact that hystero-epilepsy is sometimes cured by any form of mental treatment, by Christian science, by hypnotism, by any physical, mental, or moral influence whatever, the fact that he had a recovery after this grave operation is not worthy of much consideration. I therefore reduce the recoveries to two as a sum total, and these were in puerperal cases, which strongly tend of themselves to recovery. In two there was slight improvement, which might have been due to other causes.

His conclusions from the results obtained are "that we should continue the record in the name of humanity, and give insane women the same chance of relief, by removal of the ovaries and tubes, that sane women enjoy." If I should draw any conclusion at all from his report, I should say it indicated the let-alone policy.

He does not refer to a form of mania closely associated with menstruation—that is, nymphomania. Certain women, espe-

cially at the menstrual epoch, are so overcome by the intensity of sexual desires and excitement that they practically lose self-control and all modesty. Here social relations enter into the argument for or against operation. In these cases the mental disturbances are often so intimately associated with the menstrual functions that if menstruation can be stopped there is some probability of this form of mental disturbance being obliterated, although the possibility of the mental storm taking some other form and drifting into a uniform type of mental disturbance is not to be forgotten.

Regarding hysteria, I have to call to your attention the fact that the medical profession has not emancipated itself from the lay idea, which originated in the medical misconception that hysteria has something to do with the uterine function. Of late years, however, we recognize hysteria in the male not infrequently. Hysterics are so susceptible to every influence, are so suggestible, that a severe operation of the sort in question, when not justified by the organic conditions in the tubes or ovaries, appears a rather large and vigorous therapeutic measure against a comparatively hopeful malady. You will find, however, throughout periodical literature many cases of brilliant results in hysteria where ovariotomy has been done, and the hysteria subsequently disappeared entirely, at least as far as the reports of the cases are concerned; but you will find many more parallel cases in which hysteria has been cured by simple measures. There are a large number of cases, many unfortunately not reported, in which hysteria has led to oöphorectomy, and, so far from resulting in recovery, has been followed not only by hypochondriasis, but by confirmed melancholia and sometimes chronic mania. The fact that oöphorectomy in women years before the climacteric is reached is not infrequently accompanied by mental storms, is worthy of attention.

So far as epilepsy is concerned, I have yet to find a case in which cure resulted from removal of the ovaries and tubes. The reported cases are, as a rule, mixed up with hysteria. In one case reported by Rohé, after oöphorectomy the woman went right on having convulsions, yet he puts it down as showing much improvement. I think the personal equation in these reports will also always bear investigation.

I would lay it down as a rule that in the neuroses, mental or otherwise, the operation of oöphorectomy with normal organs,

as a therapeutic measure *per se*, should never be undertaken. This rule, like all others, has its exceptions, and in some instances it is more honored in the breach than in the observance.

A case was referred to me about ten days ago by Dr. E. W. Sawyer, of this city, at the suggestion of Dr. Dudley, in which a young woman 26 years of age presented at each menstrual epoch for about two weeks the most diverse mental disturbance, sometimes in the form of depression, sometimes excitement, sometimes alternating phases of mental and moral turpitude. As a child she was peculiar: she did not associate with other girls in school; she preferred the company of married women. At the age of 15 she first menstruated, and this was marked by a cataclysm of mental storms, which recurred at each menstrual epoch from that time, and during the first year of menstrual life she never left the house, being dominated by the imperative conception that she could not go out. She was very obstinate, and at times destructive. Later on she had desires which led to promiscuous gratification, and in this way she became pregnant and had one miscarriage about five years ago. She says the feeling at times is intolerable and she cannot master it. If she resists it she becomes violent and smashes things, attacks her father or sister, and gives way to bursts of violent, obstinate anger with vulgar and profane language. She desires to be relieved, and appreciates in her better moments her unnatural instincts. If you should take this girl before any jury, even of medical men, it would be difficult to come to a conclusion which would justify them in placing her in an asylum, but clearly she needs relief. Here the nerve storm and mental lack of equilibrium is associated with menstruation; coming on six days before and reaching its acme the first day of flow, it gradually tapers off, making two weeks of alienation in all. The hope is that, should menstruation be stopped by removal of the ovaries and tubes, the intervals of health might become longer; but there is danger that the mental disturbance may merely take some other form. In this case I have recommended operation, not so much because I think it will cure the mental disturbance, but because I think it may do so, and it will certainly prevent the prospect of illegitimate and defective children.[1]

Another case was referred to me a year ago by Dr. Byford in

[1] This patient has since been operated upon by Dr. E. C. Dudley, and has passed the usual time for menstruation without any mental or sexual disturbance.

which a woman at her second childbirth, having some slight taint of insanity, became violent. There was melancholia, heightened temperature, and at times muscular excitement, during a paroxysm of which she threw herself from an upper window. The trouble did not completely subside, and at each menstrual period since she has had disturbance or depression lasting about two weeks, followed by an interval of comparative health. Dr. Byford could find no clinical grounds for removal of the tubes and ovaries from a surgical standpoint. The operation was done, however, after other lines of treatment had failed, and the tubes were found to be cystic, but the operator did not think the condition of the ovaries as found would have justified their removal. Following the operation, at monthly intervals corresponding to menstruation, she had this same mental depression, but after the third or fourth epoch she went five weeks; and now she is in another period, during which she has gone nine weeks without mental symptoms, and her husband reports her hopeful and cheerful. Whether these intervals will grow longer I cannot say. One or two other cases of this sort might be reported, but the time since the operation is so short that I do not think they would be of any service to us in drawing generalizations.

The conservative view is not altogether without support. In a paper written by Dr. Goodell, of Philadelphia, and published in the *Medical News*, December, 1889, views so parallel to those we are considering are expressed that I venture to read to you his conclusions:

"From a large experience I humbly offer to the reader the following watchwords as broad helps to diagnosis. In the first place, always bear in mind what another has pithily said, that 'woman has some organs outside of the pelvis.' Secondly, each neurotic case will usually have a tale of fret or grief, of cark and care, of wear and tear. Thirdly, scant or delayed or suppressed menstruation is far more frequently the result of nerve exhaustion than of uterine disease. Fourthly, anteflexion, *per se*, is not a pathological condition; it is so when associated with sterility or with painful menstruation, and only then does it need treatment. Fifthly, an irritable bladder is more often a nerve symptom than a uterine one. Sixthly, in a large number of cases of supposed or of actual uterine disease which display marked gastric disturbance, if the tongue be clean the essential disease will be found to be neurotic, and it must be treated so. Seventhly, almost every supposed uterine case,

characterized by excess of sensibility and by scantiness of will power, is essentially a neurosis. Eighthly, in the vast majority of cases in which the woman takes to her bed and stays there indefinitely from some supposed uterine lesion, she is bedridden from her brain and not from her womb. I will go further and assert that this will be the rule even when the womb itself is displaced, or it is disordered by a disease or by a lesion that is not in itself exacting or dangerous to life. Ninthly, groin aches and sore ovaries are far more commonly symptoms of nerve exhaustion than of disease of the appendages. Finally, uterine symptoms are not always present in cases of uterine disease. Nor when present, and even urgent, do they necessarily come from uterine disease, for they may be merely nerve counterfeits of uterine disease."

Before the London Obstetrical Society,[1] Playfair from his enormous personal experience concludes:

"1. The removal of the adnexa is not justifiable in cases of pure functional neurosis. 2. Even when appreciable disease of the tubes and ovaries is present, an operation should not be performed until palliative treatment has first been tried. 3. The results in hystero-epilepsy and hystero-mania are so uncertain that celiotomy is not to be advised.

"The consensus of opinion was entirely in favor of the author's conclusions, Spencer Wells being especially emphatic in his denunciation of operative interference."

With these conclusions, gentlemen, I wish most heartily to agree.

THE RELATION BETWEEN THE EYES AND DISEASE OF THE FEMALE GENITAL ORGANS.[2]

BY

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I FELT greatly honored to receive the invitation of your committee to address you this evening on the relation of eye

[1] Transactions, vol. xxiii., part i.

[2] Read before the Gynecological Society of Chicago by special request.

troubles to the female genital organs. This subject has engaged the attention of oculists in a desultory manner only. Although the importance of uterine and ovarian disorders as etiological factors in ocular diseases has long been recognized, but few attempts have been made to collect, in a scientific, systematic manner, important data. Scattered throughout ophthalmic literature may be found papers describing all kinds of eye diseases, arising either directly or indirectly from the genital organs, and attributable to near and remote pathological conditions. Förster was perhaps the first to compile a systematic treatise on the relation of diseases of the eye and diseases of the body in general. In his work[1] he devotes a chapter to the subject engaging our attention this evening. Next comes the work of the Italian oculist Rampoldi, published in 1885. Jacobson, too, calls attention to this subject in "Beziehungen der Veränderungen und Krankheiten des Sehorgans zu allgemeine Leiden und Organerkrankungen." Salo Cohn also calls attention to this subject in "Uterus und Auge," Wiesbaden, 1890. Another more recent and complete work of a similar nature, "Les Maladies des Jeux dans leurs Rapports avec la Pathologie générale, par le Dr. Émile Berger," was published in 1892; and a most excellent work is that of Knies, which appeared only a few weeks ago in Germany. These writers aim but to give a general résumé of the subject—a course I will follow here tonight, since all we desire to learn is to what extent do the eyes participate in the various disorders treated by gynecologists and obstetricians.

Invasion of disease by continuity of tissue is obviously an impossibility. A direct connection, however, between the two sets of organs is found in the nervous, vascular, and lymphatic systems. The sympathetic system, by means of the renal, hypogastric, aortic, and other plexuses, communicates with the abdominal brain; and again, further up, through the carotid plexuses and various ganglia, with the motor nerves of the eye and the optic nerve. The arterial communication is accomplished by the ovarian, uterine, internal iliac arteries, the aorta, internal carotid, and ophthalmic artery and its branches. Many of the ocular disturbances are of a reflex character, as asthenopia due to flexions and versions; many are communicated directly through the vascular system, as metastatic cho-

[1] Vol. vii. of Gräfe and Sämisch, "Handbuch der Augenheilkunde," 1877.

roiditis; and, lastly, the great majority are due to general constitutional errors due primarily to diseases of the uterus and ovaries. As instances of the latter I would mention insufficiencies of the ocular muscles and those of accommodation, due to general anemia the result of various organic lesions of the genital organs. I must state here that I heartily indorse the conclusions reached by Knies, who claims that "the importance of diseases of women as the direct cause of ocular disturbances is universally exaggerated." Ordinarily these troubles are the indirect results of general systemic disturbances.

The act of menstruation, both normal and abnormal, has been held accountable for a variety of eye symptoms. Thus a limitation of the field of vision during this period has been observed by Finkelstein, involving also a concentric narrowing of the color zone. The maximum of disturbance is reached on the third or fourth day, to disappear soon after. Exacerbations of acute and chronic troubles may occur at regular monthly intervals. The literature is replete with such instances. Despagnol and Trousseau have each described a case of recurrent iritis developing at each menstrual period. Blepharitis, hordeolum, keratitis, herpes, come in this category. Whether the general bodily derangement, or reflex irritation along the sympathetic, is responsible for these phenomena is naturally a matter of conjecture only. Hemorrhages into the retina and vitreous occurring at the time of menstruation, without flow of blood from the uterus, might illogically be called vicarious menstruation. Such a case came under my care some years ago, but, as one eye showed signs of former intra-ocular trouble, I regarded the hemorrhage in the light of a coincidence.

The disorders of menstruation—menorrhagia and metrorrhagia, amenorrhea and dysmenorrhea—also present their quota of eye disturbances. The most frequent of these, however, are hemorrhages either into the tissues of the eye or into the sheaths of the optic nerve and brain. As an apparent result of suppression of menstruation, I have lately seen three cases of retrobulbar neuritis. In one of these both eyes were affected at two different periods; in the other cases but one eye suffered. The first one is of so remarkable a nature that you will pardon me if I relate it.

A lady, age 40, visited me a year ago, complaining of the gradual loss of vision in two days. She barely discerned fingers

close to her face. The peripheric vision was better; movements of the eye and pressing of the eyeball into the socket were followed by pain. The ophthalmoscopic appearance was negative. The woman attributed the trouble to suppression of menstruation induced by exposure to cold. Hot vaginal douches and sitz baths brought on the menses. After a period of five weeks the acute retrobulbar neuritis subsided with a return of normal vision. A year later the same complaint, loss of vision (acute retrobulbar neuritis), occurred to the other eye, induced by the same cause, suppression of menses. The outcome will not be so favorable this time, as the optic nerve shows signs of atrophy.

Hematemesis and copious bleeding from the rectum, as well as severe hemorrhages, such as occur after delivery, result in amblyopia and amaurosis.

The so-called nervous or reflex errors readily follow in the train of the numerous subacute and chronic inflammations of the uterus, as metritis, endo- and parametritis. Flexions and versions of the uterus, diseases of the ovaries, are also exciting causes. Förster describes at great length a complex of symptoms, reflex hyperesthesia of the fifth and optic nerves, under the name of kopiopia hysterica. Pains, various in character and degree, in the eyeball and surrounding regions, accompanied by photophobia and slight conjunctival irritation; functional disturbances of the ocular muscles, frequently without any local, abnormal, objective condition, associated with all the marked general disturbances prevailing in hysterical individuals, complete this picture of reflex disease, which sometimes has also been observed in males. This array of symptoms is attributed to a chronic inflammation of the nerve-bearing connective tissue surrounding the uterus—in other words, to a chronic atrophic parametritis. To Prof. Freund, of Breslau, is given the credit of having first recognized this disease, which he substantiated during a period of fourteen years by numerous post-mortem sections and preparations. In all cases the accompanying eye symptoms were present.

Other reflex phenomena, known as muscular and accommodative asthenopia, are described in this connection. Often the so-called female diseases are the disturbing factors, and I hail, consequently, this propitious occasion to warn you against the overzealous and destructive genius who sees in every case of

asthenopia an insufficiency of the ocular recti muscles, and who often partially, and even completely, tenotomizes these innocent tendons.

The number of eye complaints associated with menopause, pregnancy, parturition, and the puerperal condition are quite as numerous as those already referred to. I will mention only the more important ones. Retinitis albuminurica occurring in the latter half of pregnancy is often undoubtedly due to pressure of the enlarged uterus on the kidney, producing a parenchymatous nephritis, or it is caused by mechanical obstruction of the circulation. The toxic effect of the urea and other excrementitious constituents of the urine may later on give rise to puerperal eclampsia. Retinitis albuminurica, characterized by the presence of white spots or lines, usually of a stellate arrangement, about the macula lutea region, may be of so severe a form that great destruction of vision is to be feared.

The prognosis depends, naturally, on the length of gestation. In aggravated cases the induction of premature labor, or even abortion, is the only therapeutic measure.

In an essay on albuminuric retinitis Pooley arrives at the following conclusions:

"1. In all cases of pregnancy, not only should examinations of the urine be systematically made, but the eyes should be examined with the ophthalmoscope, since in a large proportion of cases where eye troubles exist the patients make no complaint of disorders of vision. Frequently such troubles can be detected with the ophthalmoscope long before any disease of the kidney is shown in the urine.

"2. In uremic amaurosis, without changes of the eye visible to the ophthalmoscope, even should the usual accompanying symptoms, such as dizziness, nausea, and threatened convulsions, be absent, their supervention is soon to be anticipated, and the immediate induction of premature labor is indicated, without waiting until the life as well as the sight of the patient is in danger.

"3. In neuro-retinitis the induction of labor is not only justifiable, but urgently demanded; in some instances called for even in the earlier months of pregnancy.

"4. It is required in cases of eye trouble recurring in successive pregnancies. A woman having once suffered in this way during pregnancy, the relationship of cause and effect should be fully explained both to herself and her husband."

In this connection I might state that retinitis albuminurica occurs in about five per cent of pregnancies.

Many ocular troubles result from long-continued vomiting, as, for instance, hemorrhages into the retina or vitreous; under the conjunctiva, producing subconjunctival ecchymosis; into the brain or optic sheaths, resulting in hemianopsia, amblyopia, and even amaurosis. The improvement frequently occurring in eye troubles and other diseases after pregnancy is accounted for by Knies in the increased power of resorption. Mydriasis has been observed during labor pains, attributable to reflex action along the sympathetic nerves. Severe hemorrhages, due to placenta previa or the removal of adherent after-births, has been followed by hemianopsia, probably the result of embolism of the cerebral arteries consecutive to syncope.

Perhaps the severest complication of puerperal sepsis is metastatic choroiditis. The infection is carried by emboli, which lodge in the choroidal vessels and give rise to choroiditis, resulting either in atrophy of the eyeballs or in complete destruction through panophthalmitis. Fortunately these cases are very rare, thanks to the rigorous antiseptic measures introduced by obstetricians. Only two weeks ago I was called to the German Hospital to examine a poor woman who presented all the symptoms of a metastatic choroiditis following puerperal fever. A short clinical history of the main points may prove interesting. A young woman, age 22, married one year, was delivered with forceps March 15th by a midwife. The patient was admitted into the German Hospital, March 20th, in the following condition: Temperature 105.2°, pulse 144; delirious; extensive laceration of perineum and cervix; in upper third of tibia a large sinus, from which pus escaped; both eyes exophthalmic; pus in the anterior and vitreous chamber; intense swelling of conjunctiva and lids. The woman died of septic peritonitis a few days later.

It is customary to refer, in a paper like this, to the dangers to which the infant's eyes are exposed during delivery. Fractures of the orbital bones, rupture and other traumatic lesions of the eyeballs, are recounted as the direct result of the application of forceps. So much has been written of blennorrhea neonatorum that I have not the courage to do more than mention it. The infection, no doubt, usually comes from the mother, although the nurse or the midwife may be the *bête-noir;* at least, Knies

affirms that he has met with small epidemics of blennorrhea among the clientèle of certain midwives. As proof of such an assertion he speaks of children, born in an unruptured membrane, who contracted the disease later on.

The extensive ground I have been obliged to cover precluded the possibility of devoting more than passing attention to any one subject.

My main object, as stated in the opening remarks, was merely to outline briefly the anatomical connection between the eyes and the female genital organs, and to mention the more common ocular complaints accompanying the diseases of the latter.

The only eye disturbances which are regarded as pathognomonic of uterine diseases (atrophic parametritis) are those reflex troubles called by Förster kopiopia hysterica, and even these observations have not been verified by later researches.

THE RELATION OF RECTAL DISEASE TO GYNECOLOGY.[1]

BY

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To thoroughly cover this subject would require quite a volume, and one would necessarily need to be not only an anatomist, but a neurologist, physiologist, and gynecologist. There are many pathological conditions in the rectum that we know positively to be in intimate causal relation with female disease, for the anatomical arrangement of the pelvic organs and their relations are such that it is impossible for any morbid condition to be present without more or less affecting most of the organs of the pelvis—for instance, it is impossible to cause anything but a very moderate amount of movement of any one organ without dragging on all the other organs of the pelvis; then there are the enormous blood supply, and the numerous lymphatics which anatomical arrangement links all together. One thing which frequently comes to the attention of the rectal specialist is rectal ulcer. I remember one case which proved to me the intimate relation between the pelvic organs and rectal disease. It was

[1] Read before the Chicago Gynecological Society, May 19th, 1893.

the case of a woman who was sent to me for frequent micturition and very severe and constant cramps and pains in the bladder, which made it almost impossible for her to sleep. This condition had existed for weeks; she had complained of pain in the pelvis, but had not complained at all of the rectum. I examined the uterus and pelvic organs through the vagina, and found an intensely painful posterior pelvic cellulitis, but she complained more of the bladder trouble than of anything else. After examining the rectum I found, just within the grasp of the internal sphincter, an anal ulcer with hemorrhoids. After operating upon the anal ulcer and hemorrhoids the bladder trouble immediately ceased, and then with hot-water vaginal injections there was great improvement and finally relief of the pelvic inflammation.

Now, what was the cause of this condition? In the first place, the anal ulcer extended up into the rectum and down to the external sphincter; in extending downward it involved the branches of the pudic nerve, which, exposed and irritated by reflex through the third sacral nerve, the main branch of which goes to the bladder, gave her the cramps and pains referred to that organ. Her pelvic trouble was related to the ulcer which extended up to the internal sphincter; the lymphatics and veins running from there would go directly up along from the rectum in intimate relation with the pelvic tissue between it and the uterus. Sepsis existed in this anal ulcer between the rectum and uterus, and caused the posterior pelvic cellulitis. But suppose this ulcer had been a half-inch higher up, then the sympathetic nerves would have been irritated; the bladder symptoms would almost surely have been absent; this exudate around the blood vessels in the pelvic tissue, which is mostly supplied by the sympathetic nerve and not very sensitive, would have gone on for a time, producing contraction; and if it went on to a cure without forming pus there would have been an irritation for a long time of the fibrous connective tissue, and the connective tissue of the whole pelvis is in direct continuation with the enormous amount of connective tissue between the circular and longitudinal muscular fibres in the rectum. Cripps lays down positive laws that long-continued irritation of the nerve of a muscle induces fibrous-tissue deposits. It may induce post-pelvic cellulitis. The first law he gives is never varied. A long-continued ulceration or irritation causes the production of fibrous

tissue; the irritated muscle will undergo a spasmodic contraction, and after a certain time it undergoes fibroid degeneration, then its fibrous tissue contracts. In a case like this, anal ulceration and cellulitis long continued without relief will invariably cause contraction of the connective tissue, and as a result we get retroposition of the uterus. In many cases the connective tissue between the rectum and the uterus contracts, which tends to retrodeviation; then the utero-sacral muscle undergoing this long-continued irritation will in many cases undergo fibrinous degeneration and contraction—a condition almost sure to produce retroposition of the uterus. Many of these cases are due evidently to anal ulcer. In describing the relation between rectal and gynecological diseases, one cannot go very far until he comes to the sympathetic nervous system, on which authorities differ so greatly that it makes it impossible at the present day to say many things without being contradicted. I am rather inclined to accept Dr. Robinson's theory of reorganization of nerve forces in the abdominal brain or solar plexus. Brown-Séquard states that there may be such an effect produced through the sympathetic as to cause a contraction of the blood vessels, producing real paralysis. He also states that he has seen ulcers along the colon produce paraplegia. In the relation of rectal disease to gynecological disease there can be no better illustration presented than that of young girls who are troubled so much with constipation and leucorrhea. Ninety-nine out of one hundred of these cases are troubled with constipation at first, which in many goes on to real impaction of the feces in the cecum. They have what they suppose to be regular movement of the bowel, but the rectum remains impacted with feces, and as a result of that impaction there is a catarrhal irritation of the rectum. Many also show a greatly congested condition of the mucous membrane, and some, real ulceration. Fulton states that irritation of a nerve may cause vaso-motor contraction at the point of irritation, and dilatation in some remote organ as a direct reflex effect; or it may cause dilatation at the point of irritation and contraction of a remote organ. We know if this ulceration in the rectum occurs from constipation, an irritation there must produce more or less effect through the sympathetic, running up the inferior mesenteric plexus to the hypogastric and then to the solar plexus, to be reflected into those channels that have the least resistance. Thus it would

go naturally to the uterus in many of these cases, and as a result might produce a congested condition of the mucous membrane and a catarrhal condition of the uterus, inducing leucorrhea. With the same condition you will find in many of these girls a normal hymen, no disease of the vagina, no disease of the uterus or appendages recognizable, except that there is a kink in the uterus, a flexion. If there is a law, as stated by Cripps, for the spasmodic contraction of the muscles, why would it not occur in those cases where exists continuously a direct irritation from this chronic colonic catarrh or impaction of feces in the rectum? We would naturally suppose the direct effect on the uterus would be to produce a contraction of the blood vessels, and, according to Brown-Séquard, those blood vessels can be so contracted as to produce paralysis. Long-continued contraction of the blood vessels would naturally weaken the muscles around the cervix more than any other part of the uterus. Fox states positively that the reflex vaso-motor spasm can take place, and from reflex irritation remain in that spasmodic condition indefinitely as long as the irritation is kept up. If irritation results from chronic constipation and impaction of feces, and the reflex is spent on the uterine blood vessels, and contraction kept up for a long time, the muscles of the uterus naturally would become weakened, and it is almost sure that the muscles on one side or the other will overbalance, and then there is likely to be a flexion. No other explanation has been made than that given by Cripps and Fox, and I am satisfied that it frequently plays an important part. We will take another case, where the inflammation begins from some cause unknown, as a pelvic cellulitis: where does it so frequently begin, when not due to infection from the tubes, as in the posterior connective tissue between the uterus and the rectum? When the pelvic connective tissue becomes inflamed and swollen it presses directly upon the superior hemorrhoidal veins which go up between the mucous membrane and the muscles for about three inches; then perforate the walls of the muscle and run on the outside of the rectum to the portal circulation. Connective-tissue inflammation frequently forms a tumor which presses directly upon these veins, and as a natural result causes congestion of the hemorrhoidal veins on the inside of the rectum. The congestion, being kept up for a long time, causes a dilatation and varicose condition of the veins, then any little abrasion or bleeding

will easily cause an ulcer. There is the same condition in pelvic cellulitis obstructing the return of venous blood, or hard feces, or spiculæ of bone, or anything that makes a little compression on these varicose veins in the hemorrhoids. An ulcer having formed may, with the conditions noted above, assume quite a large suppurating surface with renewed absorption and sepsis and increase of pelvic inflammation. Again, take a woman who has gonorrhea which shows itself persistently at the vulvo-vaginal glands; surrounding those glands immediately are the sensitive fibres of the pudic nerve. There is another centre of irritation that may frequently be reflected back to the sphincter ani; then arises an irritable sphincter as a direct effect of this irritation around the vulvo-vaginal glands. Then follows immediately a constipation which becomes chronic, and there arises a chronic irritation of the sphincter ani muscles and a more or less hypertrophied condition. If these reflex symptoms are brought about by disease beginning in the genital organs, there is no doubt that we very frequently get strictures of the rectum, resulting from pelvic disease, in the female. Ten females have stricture of the rectum to one male—that is acknowledged by the best authorities. We could easily explain that through one of the pathological laws as given by Cripps. Knowing the intimate relation of the connective tissue between the muscles of the rectum and the direct connection with the pelvic fascia, any long-continued pelvic cellulitis would bring on a contraction of the fibres in the neighborhood of this irritation, and, extending through those fibres to the rectum, would be a factor in causing stricture of the rectum. Another great factor, which is going to be acknowledged as the primal cause, is gonorrhea. Knowing that we have ten times as many strictures of the rectum in the female as in the male, and how easy it is for the rectum to become infected in the female when she has gonorrhea, especially in the lower classes where they are uncleanly, and knowing the frequency of stricture in the male caused by gonorrhea, we expect to find that gonorrhea is the most frequent cause of stricture in the female. Gonorrhea has a tendency to thrive best in the cylindrical epithelium; and once it invades those follicles and starts points of irritation, evil results follow. There is chronic irritation of the fibrous connective tissue, interrupted circulation, the longitudinal muscles become involved and the muscular fibres become destroyed,

the fibrous tissue is increased, and there is stricture of the rectum.

Another frequent cause of pelvic inflammation, and no doubt sometimes of inflammation of the appendages, are these deep-seated ulcers which occur in the rectum from the various causes I have explained, extending through its wall; and then if the tube or ovary is lying prolapsed in relation to the rectum, naturally the inflammation would extend into that organ and cause disease; and frequently these ulcers in the rectum perforate through the rectal wall into the connective tissue, being a direct cause of pelvic cellulitis. The pelvic fascia is all connected, so that when once infection extends into the pelvic tissue, and it goes on to suppuration, there will be burrowing of these deep-seated abscesses.

There is no doubt that if the gynecologists would more thoroughly examine the rectum in these cases of pelvic abscess so intimately adherent to that organ that it is impossible to remove the sac without making a fistula, they would find, on looking up the history, that many of the cases originated from ulcers of the rectum.

Much more could be said about the relation of the rectum to the pelvic organs, if once the neurologists could come to a definite understanding as to the nature of the reflexes. But now that the subject is attracting such general attention, there is no doubt that within a few years many of these things will be cleared up, and we will have a more definite idea as to what slight inflammations or rectal diseases may bring about in diseases of the appendages and the uterus.

FIVE CASES OF LAPARATOMY.

WITH MACROSCOPICAL EXAMINATION OF SPECIMENS.

BY

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(With five illustrations.)

ABDOMINAL section for the removal of the appendages is becoming such a common operation that the young surgeon is in danger of regarding it as a panacea for all pelvic disturbances.

As a method of relieving pain and curing the patient in a short space of time, surgical interference is so alluring to both physician and patient that the conscientious surgeon must have some rule of action to guide him in his decisions, or he may make many an unjustifiable section.

When is the surgeon justified in removing tubes and ovaries for the cure of chronic pelvic troubles? Surely when he can give a clear and logical reason for their removal, which will warrant a prognosis of future health to the patient which no other method of treatment reasonably offers. In the following five cases, each one of which is typical of a large number, we submit that operative measures were clearly justifiable.

CASE I. *Removal of the Appendages for Double Pyosalpinx and Hematoma of Left Ovary resulting from Gonorrhea.*—The patient, Miss H., age 25 years, came to the clinic with a history of gonorrheal infection three years previous, and of a produced abortion a few months previous to the first acute attack of gonorrhea. She was very ill at that time for several weeks, and ever since the abortion menstruation has presented a uniform history of menorrhagia and dysmenorrhea. At times the flow has appeared every two weeks, accompanied by severe intermenstrual pain. The patient was incapacitated for work and her life had become a burden. She was under treatment almost the entire time during the three years, with slight improvement for a time, followed always by severe exacerbations from the slightest cause. Physical examination revealed both vulvo-vaginal glands secreting pus, also profuse purulent discharge from cervix, with cystitis and urethritis. On either side of the uterus was an indefinable mass of exudates, worse on the left side, with tenderness and pain on pressure. Patient was under treatment with hot-water douches and glycerin tampons for four months, which improved the local condition somewhat, but two months previous to the operation she had a severe exacerbation of all symptoms. She insists that she was not without pain from that time until after the operation. The whole history of the case is that of progressive invasion from gonorrheal infection. The vagina had a rough, inelastic feel. The virus had attacked successively the vulvo-vaginal glands, the urethra, vagina, cervix, uterus, and tubes, and the bimanual examination in ovarian region warranted a diagnosis of ovarian infection as well. The operation was made December 26th at the Charity Hospital.

Both tubes were enlarged and thickened, containing pus. The right ovary was about normal in size; the left as large as a hen's egg and filled with blood. Both ovaries were bound down by adhesions and had to be literally dug out of the surrounding tissues.

The Trendelenburg position, introduced in Chicago by Dr. F. Byron Robinson, simplified the operation greatly. By practically removing the intestines from the field of operation, one of the principal complications in such cases was eliminated. After thorough irrigation the wound was closed with silkworm-gut



FIG. 1, CASE 1.

sutures and a drainage tube inserted on account of the extensive adhesions broken up. The patient made a good recovery and left the hospital in four weeks. At the present time, nine months after the operation, she is well and stronger than she has been for four years. She is working in one of the city hospitals, preparing herself to be a trained nurse.

The points in this case which, in my opinion, justified the operation are: 1. Periodic exacerbations; recurrent pelvic peritonitis. 2. Positive history of gonorrhea. 3. Presence of old exudates, revealed by physical examination. 4. Constant suffering and incapacity for work. 5. Danger of sudden rupture of pus tubes into peritoneal cavity.

The macroscopical examination of the tubes and ovaries pre-

sented many interesting features. The *perisalpinx* of right tube shows various stages of peritonitis. The peritoneum is thickened with deposits over the broad ligament; musculature not much changed; some infiltration with inflammatory products. The *endosalpinx* is edematous and friable; is so large that it packs the lumen of the tube full, making it difficult to force the fluids through the tube. This condition necessarily creates excessive peristalsis and accounts for the premenstrual tubal colic from which the patient always suffered. Further examination reveals hypertrophy in the main portion of the endosalpinx and atrophy in localized patches. The *ovary* shows old peritonitis and incipient cystic degeneration. From the *parovarium* hangs a dilated Kobelt's tube, size of a hazelnut, with a pedicle one inch long. The left appendages are surrounded by a dense mass of adhesions. The fimbriated end of the tube is attached to the ovary by its whole circumference, thus accounting for the infection of the ovary. The four drachms of pus were confined in a sac composed of both ovary and tube. The *perisalpinx* is much thickened by old inflammatory products; musculature also thickened. The *endosalpinx* presents the same appearance as in the right tube in an exaggerated degree. Under the lens the tubal plicæ appear in luxuriant folds, showing a high degree of old catarrhal inflammation. The lumen of the tube is irregularly dilated, and the mucous membrane shows an increase of pathological conditions in the ampulla. The fimbriated end of the tube remains open, allowing the gonorrheal infection to pass into the ovary. The *ovary* was practically composed of degenerated cysts, some containing pus. One cyst proved to be a hematoma an inch in diameter. The left broad ligament is much more thickened than the right. The *parovarium* presents several elongated Kobelt's tubes. These specimens are typical of the progress of gonorrheal infection.

Case II. *Removal of Normal Tubes and Ovaries to stop Hemorrhage in an Interstitial Fibroma of the Uterus.*—The clinical history of the patient is brief. Aged 28 years, the mother of three children, she has enjoyed good health until about two years ago, when she began to have severe hemorrhages, which continued to increase in frequency and severity until the operation. This case presented no definable disease other than the uncontrollable hemorrhage, which was fast bringing her to an anemic, neurotic condition. Examination revealed a tumor,

the size of a large fist, in fundus of uterus, a smooth myoma enlarging the uterus uniformly.

The induction of an artificial menopause by oöphorectomy in uterine fibroma is a comparatively recent operation. Trenholme published the first case on record in 1876, and it is interesting to

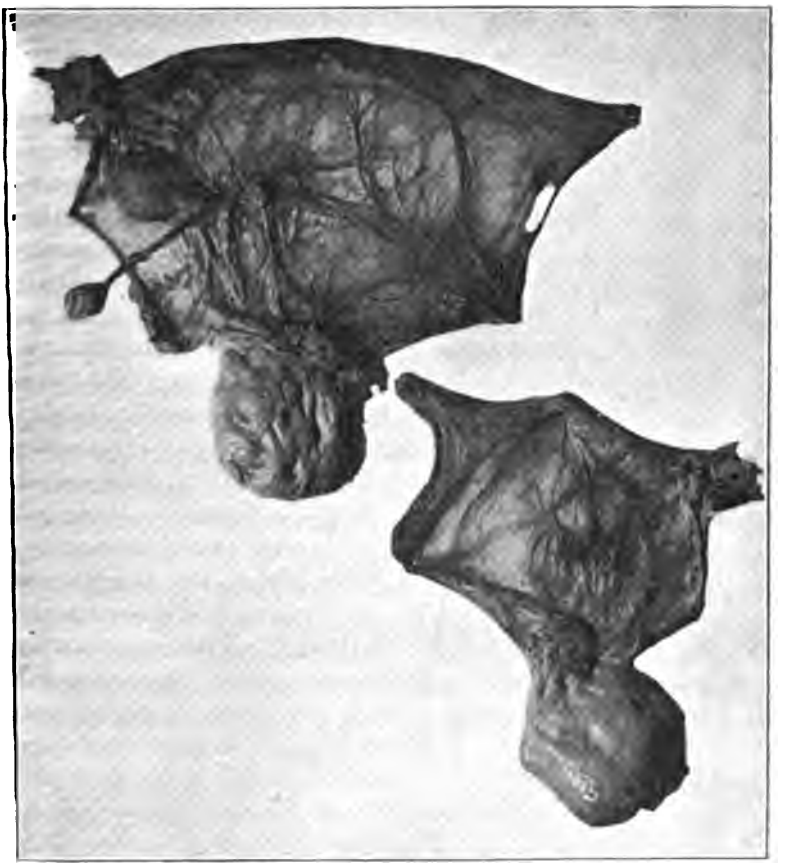


FIG. 2, CASE 2.

note the gradual evolution of this method of dealing with one of the most perplexing and difficult conditions presented to the gynecologist. The removal of normal tubes and ovaries for dysmenorrhea was done several years previous by Hegar and Battey; Trenholme was followed very closely by Hegar in applying oöphorectomy to the cure of hemorrhage from interstitial uterine myofibroma. The surgical question of to-day in regard

to hemorrhage from interstitial fibrous growths has resolved itself practically into a choice between hysterectomy and castration or removal of the normal appendages. In 1880 Thomas gave as the operative procedure in vogue at that time in these cases excision, écrasement, avulsion, enucleation, and the production of sloughing, and recommended all but the last method, saying that he mentioned it only to condemn it in the strongest terms. Enucleation, he claims, is feasible *even* in interstitial fibroids, although he states further that there are great dangers attendant on this operation—namely, "exhaustive hemorrhage, perforation of the uterus, pyemia, and inflammation of pelvic viscera." Of oöphorectomy he says simply that the operation had been made at that date (1880) only seventeen times with eleven recoveries and six deaths, and notes that Hegar, who made twelve of these seventeen operations, regards its efficiency in very large fibroids as doubtful. It will be remembered that Thomas wrote only four years after Trenholme published his first case. Graily Hewitt, writing in 1883, took the most radical position of any of the surgeons at that time. He says: "Battey's operation (oöphorectomy) is an alternative to hysterectomy." Skéne in 1889 wrote: "Removal of the ovaries for severe hemorrhage has given satisfactory results," but adds, "the operation is still on trial." Pozzi, in his new work, which has revolutionized the study of gynecology, discusses only the two surgical measures in connection with this condition—namely, hysterectomy and oöphorectomy. The choice of operation must of necessity be left in each case to the judgment of the surgeon. This case was sent to the hospital by Dr. Mary B. Shibley and the operation performed January 14th. The patient made a rapid recovery, and when last heard of, six months after leaving the hospital, there had been but one hemorrhage, which occurred three weeks from date of operation.

The examination of specimens from this case showed the *left tube and ovary* practically normal; no adhesions; the muscular wall very thin, but normal in structure. Fimbria at abdominal ostium normal. *Parovarium* showed several pathological processes: (*a*) Gärtner's duct dilated for one and one-half inches; (*b*) Kobelt's tubes dilated into cysts, one non-pediculated, size of a hazelnut, and one cyst, size of a pea, with pedicle one inch long; (*c*) the vertical tubes of the parovarium dilated into several cysts. The broad ligament was very vascular; the ovary

normal, covered with numerous scars. The *right tube and ovary* presented no adhesions; tube almost straight, with severe constriction at fimbriated end; lumen of tube sacculated; mucous membrane normal; tubal muscular wall very thin; Gärtner's duct appeared dilated one-half inch. Vertical tubes showed a few dilatations. Broad ligament was very vascular; ovary presenting a condition of incipient cystic degeneration.

CASE III. *Removal of the Appendages for Double Salpingitis and Ovaritis.*—Mrs. C., age 36 years, gave a history of illness of over seven years' duration. While in New York she was under treatment by a celebrated surgeon, who advised an ope-

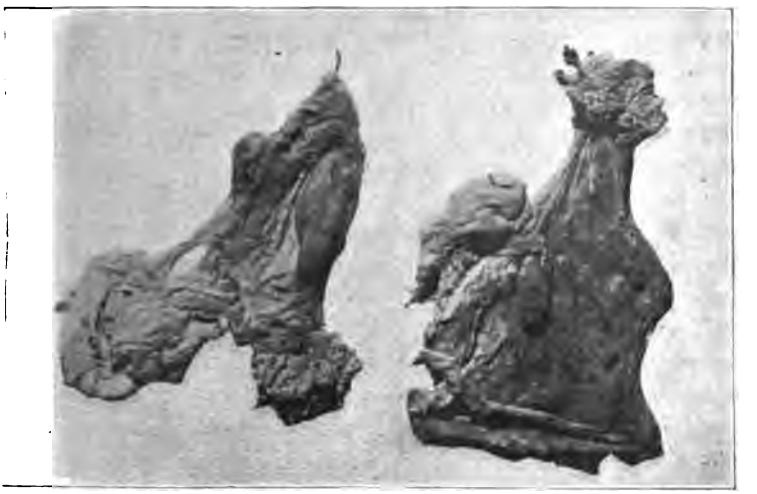


FIG. 3, CASE 3.

ration three years previous. Patient has been under treatment at the Columbian Dispensary for several months without improvement. She complained of a constant pain with periodic exacerbations, and was practically a neurotic wreck, long ago incapacitated for work. Both tubes and ovaries were found bound down with old adhesions. The operation was performed January 27th. The improvement in all nervous symptoms was marked from the time the patient left the hospital, and now, over six months from that time, the patient is practically well, both mentally and physically. Macroscopical examination of specimens: The appendages were torn out of a solid mass of adhesions and were found covered with old and recent exudates.

The *tubes* presented typical examples of convolutions lying curled up in the broad ligament. The *perisalpinx* had been thickened by repeated peritonitis. The *musculature* was atrophied. The tubes were easily stripped out of the broad ligament. On slitting open the tube the *endosalpinx* appeared under the lens, disorganized and very friable. The *ovaries* were shrunken to the size of a large bean. The *parovarium* showed numerous dilated cysts.

CASE IV. *Removal of the Appendages in a Girl of* 20 *for Hystero-epileptic Convulsions of Six Years' Duration.*—The important points in the history of this case are the regularity and frequency of severe convulsions. The spasms, as a rule, preceded the flow. There is a history of inveterate constipation. Patient had been under the usual medical treatment for her condition persistently for the last four years and was growing steadily worse. Her mind was getting weak, and her friends were fearful that she would become "foolish," as they expressed it. Operation was decided upon in this case after much hesitation and only as a last resort, with the conviction that there was no other treatment which offered even the slightest hope of recovery. The first month after the operation she had quite a severe convulsion at the accustomed time of menstrual activity, but otherwise she improved very much. Five months after the operation the following report was sent to my office by her guardian: "Your patient is doing nicely, and we believe she will come out all right." It is, of course, too early to say definitely that the case is cured, or even permanently benefited. The principal feature of the macroscopical examination of specimens was the extremely convoluted, contorted tubes with short, spiral angles. The peritoneum does not dip down from one bend to the other, but the convolutions appear in contact with each other. The muscular wall of the *right tube* is very thin. The *mucous membrane* appears normal. The tubal lumen is very wide. The parovarium consists of Gärtner's duct and eleven vertical tubules, one long pedunculated and one non-pedunculated Kobelt's tube. The broad ligament is non-vascular. The *right ovary* is cystically degenerated. One cyst, three-fourths of an inch in diameter, is lined with a distinct membrana granulosa. Smaller cysts, which are degenerated follicles, lie directly under the surface of the ovary. The *left tube* is even more contorted than the right. There are no adhe-

sions. Muscular wall is very thin, the mucous membrane normal. The lumen of the tube is irregularly sacculated and wide. The specimen presents two abdominal ostia. The fimbriæ are normal. *The parovarium* consists of a scarcely visible Gärtner's duct, fourteen distinct vertical tubules, with two pedunculated Kobelt's tubes, one of which is fimbriated. The verti-

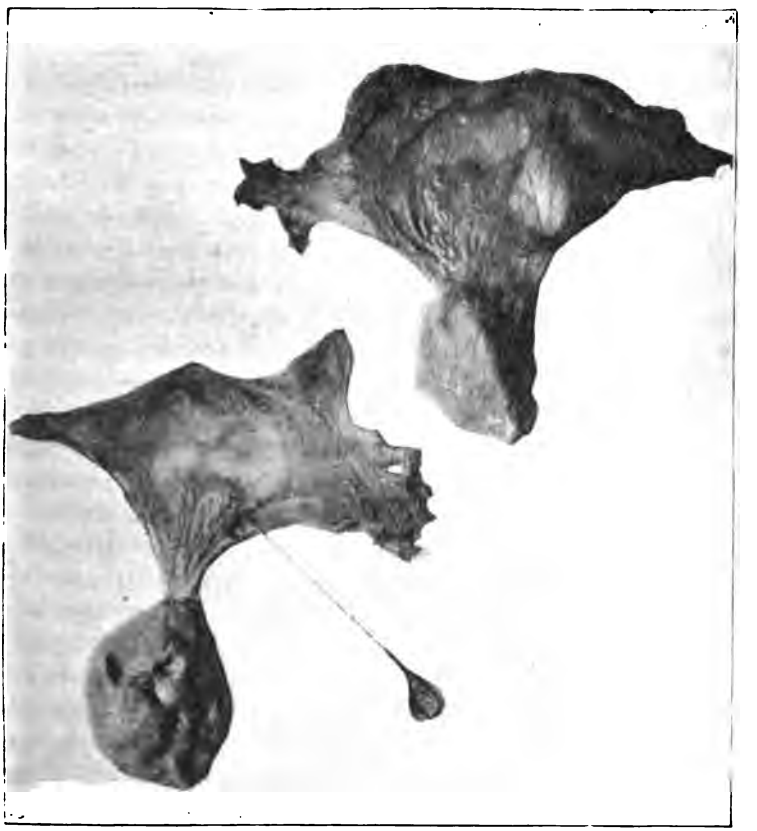


FIG. 4, CASE 4.

cal tubes reach to the surface of the ovary. The *left ovary* is cystically degenerated. It may be noted that all ovaries are cystic, but when the cysts take on pathological changes the term cystic degeneration becomes applicable. The size of the ovaries varies as greatly as the size of the mammæ. The pathological condition of cystic ovaries is not yet settled by pathologists, but varies within wide limits. The patient suffered with premen-

strual pain or tubal colic consequent upon the contorted tubes. The angles of the tubes allowed the passage of the menstrual fluid with difficulty. The obstruction lies at the angles of the tube, increasing peristaltic action and inducing tubal colic.

Cases of this character which are permanently benefited by removal of the appendages cannot be considered true epilepsy, but must be viewed as a species of neurosis dependent on menstrual functions.

Case V. *Double Salpingitis with Cystic Degeneration of both Ovaries, complicated with an Abscess in the Walls of the Uterus.*—The patient is 30 years old, the mother of three children. The last confinement occurred seven weeks previous to her entrance into the hospital. Four weeks after labor a severe inflammation occurred in the pelvis. Ten days after the beginning of attack the patient came to the Columbian Dispensary, and the case was diagnosed as double pyosalpinx by Dr. Bertha van Housen and sent to the Charity Hospital for operation. Patient entered the hospital with a temperature of 104°, pulse 130. The operation was performed February 27th. On the left side the tube was found very much enlarged and tortuous, and, together with the ovary, bound tightly to the fundus of the uterus with extensive adhesions. On the right side the tube and ovary were not quite so much enlarged, but also adhered to the fundus of uterus as well as to portions of the mesentery. The entire body of the uterus was very much enlarged, and the unique feature of this case consisted in an abscess in the wall of the right horn of the uterus, just escaping the right tube; the cavity of the abscess, after the evacuation of the pus and irrigation, being about the size of a small hen egg. A prolongation of the mesentery had attached itself by exudates to the upper wall of the abscess, and had formed a little cartilaginous covering, which, when torn away from the uterus, opened up the abscess, the pus flowing freely out. Both tubes and ovaries were removed by tying close to the uterus and freeing the adhesions to the uterus and mesentery. On tearing away the mesentery from its attachment to the uterus the hemorrhage was profuse. The torn mesentery was immediately ligated, cutting off the ragged edges which had been torn away from the uterus. After thorough irrigation of the pelvic and abdominal cavities with hot water, and thorough cleansing of the pus cavity, one side of the wall of the abscess was clamped with the

forceps, raising the uterus as a whole up to the abdominal incision, a drainage tube placed in the Douglas cul-de-sac, and the wound closed. The forceps was left in position for two days. The patient made an uneventful recovery.

The literature on uterine abscess is very scarce. Although I have had access to the principal standard works on obstetrics

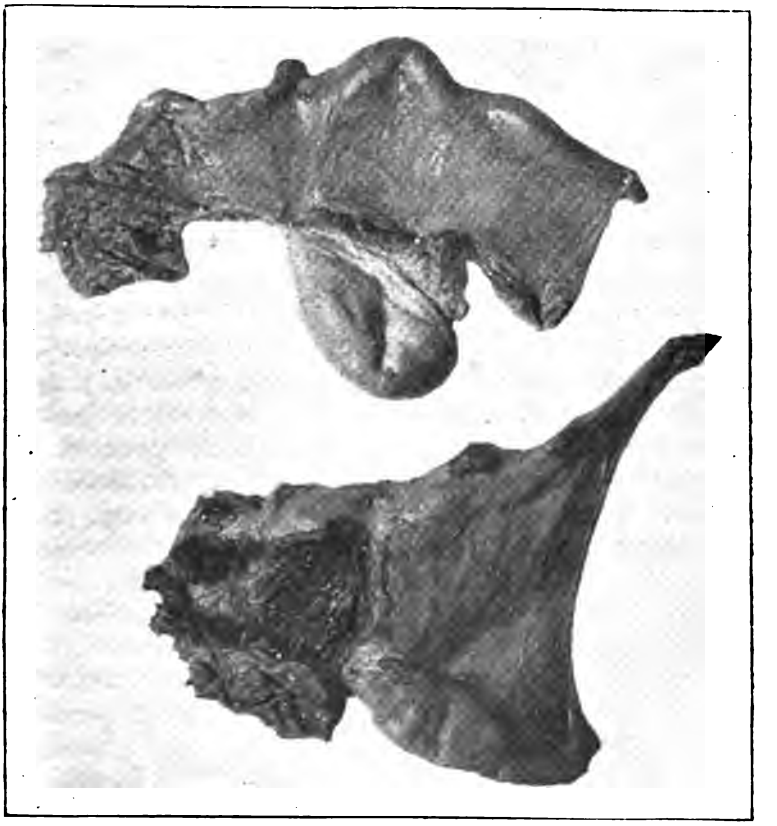


FIG. 5, CASE 5.

and gynecological surgery, I have been able to find but three cases on record, two of these being given as immediate sequelæ to parturition. Schröder mentions one case on page 756 in the original, and Lusk one on page 625. A third case was reported during the last year in THE AMERICAN JOURNAL OF OBSTETRICS.

Macroscopical examination showed *right tube* exceedingly convoluted, with extensive adhesions at fimbriated ends. Mus-

cular wall disorganized and infiltrated with inflammatory products. Mucous membrane is entirely destroyed. Lumen of the tube is dilated and sacculated, and three-fourths of its extent filled with pus. The *mesosalpinx* is very much thickened with inflammatory products. One Kobelt's tube, with a pedicle one inch long and a cyst at the end, is adherent to the fimbriated end of the tube through secondary inflammation.

The *ovary* is fibrous, with follicular degeneration. *Left tube* is enormously thickened and convoluted. The peritoneum shows ancient adhesions. The *endosalpinx* is destroyed. The left tube contains a large amount of white connective tissue in the musculature, the muscular fibre being practically displaced by the firm compression of the newly formed connective tissue. The *perisalpinx* is enormously thickened by repeated attacks of peritonitis. Old and recent organized bands are found on the entire perisalpinx, especially on the ampulla.

There is no doubt that this condition had its origin in gonorrheal infection, with exacerbation at the puerperal period.

I performed these operations in the Chicago Charity Hospital, in the service of Dr. F. Byron Robinson, and wish to thank him for assistance in making the macroscopical examinations. The photographs of the specimens were made by Dr. E. S. Bailey and Mr. Charles Howard Trego, whose beautiful and accurate work I am pleased to acknowledge.

THE SECOND SUCCESSFUL CESAREAN SECTION PERFORMED IN CINCINNATI.[1]

BY

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THE patient, a lady aged 24 years, of Irish descent, primipara, rather delicate, and of a highly nervous temperament. I was first called to see her on the evening of the 14th of April, about 6 o'clock. The patient informed me that she had had pains of a more or less severe character during the day. On digital examination I found what I at first thought to be a retroflexed uterus and a vertex presentation. I thought it was a

case similar to one by Oldham, described in most of the text books. There was present a hard, solid tumor, occupying the sacral cavity and extending above the pelvic brim, and I found the os above the symphysis pubis. However, I soon convinced myself that this probably had no connection with the uterus. Inspection of the abdomen showed at once that there was none of the uterus below the pelvic brim; indeed, it was very high up. The os was not dilated, and I was not able at this time to make a positive diagnosis of the position, although I thought it was a vertex presentation.

At this time I satisfied myself that the child was alive. The pelvic diameters at the outlet were about normal—about five inches; the conjugate diameter at the brim was barely sufficient to admit my two fingers—about one and a half inches. The pains were tardy, but not at all violent. About 10 o'clock there was some dilatation, sufficient to admit my index finger, and I could feel the vertex. The patient's condition was perfectly satisfactory. I recognized at this time that delivery could not be accomplished without an operation. I sent for my brother, Dr. Robert Mitchell, who remained with the case all night. Early in the morning the membranes ruptured, and at 5 o'clock he sent for me, and I found most of the liquor amnii had drained away. The pains had become quite violent and her temperature had gone up to 101°, pulse 112. I also found by this time that the os had become very thin, and I was able to recognize the position of the vertex: it was the right occipito-anterior. I then decided that, in view of the deformity existing, the proper procedure would be to make a Cesarean section. I did not deem it a case which would justify a symphysiotomy. At 8 o'clock Saturday morning, April 15th, assisted by Dr. Charles Reed, Dr. Elgar Reed, Dr. Robert Mitchell, and a trained nurse, I made the operation at the home of the patient, which consisted of one room on the second floor of a tenement house. The hygienic surroundings were anything but favorable. I insisted upon taking the patient to the Presbyterian Hospital, and would willingly have consented to her being taken to any hospital; but the husband would not give his consent, and the woman was positively averse to such a removal. At 8 o'clock the patient was placed under the influence of chloroform, after having been given morphine with atropine hypodermatically. At this time the temperature

was about 101°, pulse 116. The anesthetic was readily administered, and within ten minutes from the time I began the operation I delivered a seven and a half pound male child. The child was born asphyxiated, but Dr. Reed succeeded in resuscitating it. The incision through the abdominal wall was made a little different from the method employed by most operators. The uterus was stretched out and was of extreme length, the fundus being under the ensiform cartilage. Therefore two-thirds of the incision was made above the umbilicus, instead of two-thirds being made below. The incision was at least eight inches long. Before entering the uterus I took the precaution to throw a loop of rubber tubing around the cervix. In this way I had no difficulty in controlling the hemorrhage, which was not at all alarming. Of course there was bleeding from the sinuses, but this was easily controlled by pushing the edges of the wound together. An incision about five inches long was made in the median line through the fundal and middle zones. It was not necessary to observe any extra caution to keep the amniotic fluid from getting into the abdominal cavity, for it had almost all drained away. I was correct in my diagnosis as to position, and the child was extracted by the feet. The placenta was delivered through the abdominal and uterine wound.

I did not flush out the abdominal cavity nor wash out the uterus. In closing the wound in the uterus I carried out a plan of procedure which I have had in mind a number of years: that is, I only put in one row of sutures, which only went through the peritoneal coat of the wound. I had satisfied myself that the deep sutures were not necessary, and with a small needle, not unlike that employed by Emmet for sewing up the cervix, I introduced a continuous suture through the peritoneal coat of the uterus, making the sutures close together and probably twelve in number. While I was stitching the uterus the organ was probably two-thirds out of the abdominal cavity. I was particularly struck with the rapidity with which the uterus contracted. The placenta had not been delivered a minute until the uterus had contracted until perfectly firm and assumed the typical cricket-ball appearance. I did not put in the sutures until this had taken place, and I did not knead the uterus, nor did I use friction. There seemed to be enough strength to bring about contraction naturally. After being closed the

uterus was dropped back into the cavity, which was then closed with eight silkworm-gut sutures. The vagina was not irrigated, nor was any drainage tube put into the os, since there was sufficient dilatation of the os before the operation was made. She had been in labor about fourteen hours.

The hygienic surroundings were unfavorable, but everything possible in the way of asepsis and antisepsis was done. There was nothing eventful in the history of the case. The temperature the third day was 102½°, pulse 120, but the next day, after the bowels had been moved by doses of calomel, one-eighth grain repeated every fifteen minutes, the temperature and pulse became normal. The stitches were removed the seventh day, union occurring by first intention, no stitch-hole abscesses, and no indication of sepsis. On the eighth day the temperature and pulse were normal. On the evening of the eleventh day we changed nurses; the patient became very nervous, and on the morning of the twelfth day she had puerperal mania. It was the most violent case of puerperal mania I ever saw, and even now she is not perfectly free from it, although she dresses and eats and has a regular stool every day, and has had a normal temperature for more than a week. She still has some delusions. I simply mention this as a complication, for I do not think that puerperal mania was caused in any way by the Cesarean section.

The principal feature in this case is the manner in which the sutures were introduced, the kind of suture, and the way in which we allowed the patient to convalesce without meddling with the lochia or washing out the wound. The lochia were normal and there was no odor from them. I examined her to-day digitally, and found the pelvic diameters the same as at the time of the operation. In looking up the literature on this subject I find that the man who has apparently had the best result is Dr. Murdoch Cameron, of Glasgow, Scotland, who made a report, published in the *British Medical Journal*, 1892, of ten cases of rachitic women upon whom he operated, with a mortality of one mother and one child. He introduced but one row of sutures, through two-thirds of the uterine wall, and in none of his cases did he wash out the uterine cavity, or irrigate the uterus, or put in a drainage tube.

CHRONIC OÖPHORITIS AND ITS TREATMENT BY ELECTRICITY:[1]

A CLINICAL STUDY.

BY

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DURATION OF THE DISEASE.—Chronic oöphoritis is essentially a long-time disease, having but little or no tendency to spontaneous recovery. Patients, when seen, have usually experienced their symptoms for years, but few presenting themselves early. As, pathologically, there are two distinct forms, which clinically can seldom be distinguished apart, both forms generally coexisting in the same case, the course of the disease will necessarily vary. If the cystic form be the most prominent, the tendency is to cystoma or to the destruction of the follicles and final atrophy of the gland in part or in whole, with absolute or partial cessation of function. If the interstitial variety prevail, enlargement of the gland is the rule, with continued but perverted functionating and a long, almost endless course. With the menopause, which, however, is liable to be delayed, the symptoms cease. As patients are usually unobservant, often failing to note the time of the beginning of their ailment, it is difficult to determine the duration of their malady in many cases. However, in 107 patients this was possible, the average in these being a duration of about 2½ years. Thus:

Duration less than 6 months			32 cases.
"	6 months to 1 year		15 "
"	2 years		23 "
"	3 "		10 "
"	4 "		6 "
"	5 "		5 "
"	6 "		9 "
"	7 "		2 "
"	9 "		1 case.
"	10 "		1 "
"	11 "		1 "
"	12 "		1 "
"	13 "		1 "

COEXISTING CONDITIONS.—Simple, uncomplicated chronic oöphoritis rarely if ever exists, but such complications as do occur,

[1] Concluded from p. 389, September number.

however, not being usually secondary to it, but rather due to the same cause which produced the ovarian inflammation. Extension backward along the genital tract from the ovaries practically never takes place. In fact, the only true secondary condition which I have met with is the pelvi-peritonitis, or rather the peri-oöphoritis, which so frequently binds down the displaced ovaries. The following constitutes a list of the coexisting diseases found in my 250 cases of chronic oöphoritis, excluding ovarian and uterine displacements, several conditions, of course, frequently coexisting in the same patient:

Vulvo-vaginitis	2 cases.
Lacerated perineum	8 "
Cystocele	5 "
Rectocele	1 case.
Cysto-rectocele	3 cases.
Stenosis vaginæ	1 case.
Conical cervix	11 cases.
Supravaginal hypertrophy of cervix	1 case.
Cervical mucous polypi	2 cases.
Cervical laceration, bilateral	43 "
" " left	7 "
" " right	3 "
" " stellate	2 "
Cervical stenosis	24 "
Subinvolution, uterine	16 "
Areolar hyperplasia	28 "
Chronic endometritis, corporeal	25 "
" " cervical	126 "
" " villous	2 "
Pachysalpingitis	15 "
Pyosalpinx	2 "
Hydrosalpinx, left	12 "
" right	5 "
" bilateral	1 case.
Broad-ligament cyst	1 "
Chronic pelvic peritonitis	12 cases.
Chronic cellulitis	8 "
Uterine fibroid	4 "
Peri-oöphoritis	32 "

SEQUELÆ.—These are: (1) displacement of ovary; (2) sterility; (3) abortion; (4) superinvolution; (5) uterine atrophy.

1. Whether or not a healthy ovary can be displaced to a pathological degree is very problematic. The mere fact that the ovary assumes and retains a new position points to the previous existence of disease. The enlarged and weighty ovary,

being free to move in any direction, has a tendency to sink down, the degree of descent being determined only by its weight, position of the uterus, and length of the ovarian ligament. All chronically inflamed ovaries are more or less displaced, but those only where the malposition is extreme can be considered cases of ovarian displacement. I do not remember to have ever met with a perfectly healthy ovary prolapsed. Displacement is due to one of three causes always: increased weight, relaxed attachments, or the drawing of contracting peri-ovarian adhesions. Retroflexion and retroversion of the uterus have often been assigned as prominent causes, but their influence, though undoubted, is not as great as supposed. Whenever such cases have occurred in my experience the ovaries always gave more or less evidence of disease, no matter how early seen. True, as coexisting conditions retrodisplacements and descensus ovarii are quite common, but that they commonly stand in the relation of cause and effect is extremely unlikely. It is also true that malpositions of the uterus backward, as we have seen, are rather more common in chronic oöphoritis than in the generality of uterine diseases, but the difference is hardly great enough to account for the frequent occurrence of ovarian descent. When we come to compare oöphoritis with and without displacement, this difference becomes more marked. Thus we have the following table, leaving out of consideration complicated forms:

Position of uterus.	Ovaries malplaced.			Ovaries not malplaced.		
	Number.	Per cent of all cases of malposition.	Per cent of each form of uterine position.	Number.	Per cent of all cases of not malplaced.	Per cent of each form of uterine position.
Normal	26	21.7	33.8	51	43.6	66.2
Anteflexion	22	18.3	53.7	19	16.2	46.3
Anteversion	9	7.5	40.9	13	11.1	59.1
Retroversion	36	30.0	66.7	18	15.4	33.3
Retroflexion	11	9.2	68.8	5	4.3	31.2
Lateroversion	6	5.0	42.9	8	6.8	57.1
Descensus	10	8.3	76.9	3	2.6	23.1

The explanation for this state of affairs is that we are dealing with a vicious circle: the uterine malposition and the displaced inflamed ovaries, owing their origin primarily to the same cause, react on each other to aggravate and accentuate.

Ovarian displacement is extremely common in oöphoritis; for

of my 250 cases, in 123, or no less than 49.2 per cent, did this occur. Both ovaries may be displaced at the same time. If this is so, the left usually sinks lower in the pelvis than the right; in fact, this is a rule which holds good, the left ovary almost invariably departing most from its normal position and being found at a lower level than the right ever assumes in displacement. As regards the relative frequency of malposition of the two ovaries, they are displaced with about equal frequency. This is contrary to the usual teaching of text books, the left being considered far more subject to this accident than the right, but such is my experience. Thus of the 123 cases of displacement, in 42.3 per cent it was the right ovary, in 42.3 per cent the left, and in 15.4 per cent it involved both ovaries. The displacement may be downward, downward and backward, forward, or outward, the second form being by far the most common.

	Right ovary.	Left ovary.	Both ovaries.	Total.
In Douglas' pouch.....	38	42	17	97
In lateral pouch.....	13	7	2	22
At the side of the pelvis...	..	2	..	2
Anterior to the uterus....	1	1	..	2
Total.....	52	52	19	123

If the displacement has continued for some time the ovary seems to act as an irritating body, its inflamed condition becomes aggravated, peri-oöphoritis is set up, and it finally becomes more or less firmly adherent to the surrounding parts. In no less than 20 cases was the ovary immovably fixed, the usual seat of attachment being the postero-lateral wall of the uterus or the pouch of Douglas. In two cases the left ovary was found firmly agglutinated to the side of the pelvis. In quite a large number of other cases the ovaries were loosely adherent.

Dyspareunia and painful defecation are the two symptoms indicative of ovarian descent into or near Douglas' pouch. A digital examination only, however, can decide the position of the ovaries positively. When displaced laterally or anteriorly they give rise to no special symptoms, and are discovered only on palpation after being searched for in their usual positions.

2. *Sterility*, whether original or acquired, is common in chronic oöphoritis. Of the 238 married having this disease, 68 at the time of presenting themselves had never been pregnant;

and of these, 43 had been married three years or over. That is, 1 in every 3.5 cases had failed of impregnation; or, considering only such as had been married three years or over absolutely sterile, 1 in every 5.5 cases was so. As compared with ordinary gynecological patients, this shows a very high rate. Thus, of 3,447 such cases coming under my care, 678 had never been impregnated, 314 of these having been married three years or over, giving ratios of 1 to 5.1 for all nulliparous cases and 1 to 11 for the truly sterile. Absolute sterility, therefore, is very common in chronic oöphoritis, dependent, no doubt, partly upon the coexisting conditions, whether uterine, tubal, or peri-uterine, but also in great part upon the diseased ova supplied by the chronically inflamed ovaries, or upon the inability of the ova to make their exit from the ovary by reason of the peri-oöphoritis so often present. If the woman has previously borne children, child-bearing is almost certain to cease during the continuance of the disease; or, if she become pregnant, she is very apt to abort. Thus, of 170 women who had been pregnant, the time of last confinement was noted in all but 11 cases, as follows:

Time since last confinement.	Last delivery at full term.	Last delivery an abortion.	Total.
6 months and less	7	19	26
6 months to 1 year	15	5	20
1 year to 2 years	16	9	25
2 years to 3 years	22	7	29
3 years to 4 years	7	2	9
4 years to 5 years	6	4	10
5 years to 6 years	7	5	12
6 years to 7 years	5	..	5
7 years to 8 years	5	1	6
8 years to 9 years	1	..	1
9 years to 10 years	3	1	4
Over 10 years	12	..	12
Total	106	53	159

showing the long interval that had passed since the last impregnation in a large percentage of the cases. This is the more remarkable when it is remembered that the patients were principally in the prime of child-bearing life and came mostly from prolific races in whom rapid succession of pregnancies is the rule. Besides the 68 who had never been gravid, 28 others had aborted once, this being their only pregnancy. Of 53 women who had been married less than three years, 38 were sterile and 15 had given birth to 16 children; of 68 others, married from

three to five years, 36 were childless and 32 had borne 53 children; of 117 married over five years, 22 were sterile, while 95 had given birth to 317 children. That is, of 238 married women, 96 had never borne any living children, while 142 had given birth to 386 children, including three sets of twins—an average of 1.62 for all, or 2.72 for parous women, as against an average of 2.54 for all, or 3.60 for parous women, as deduced from 3,447 gynecological cases drawn from a similar class of women as the chronic oöphoritis cases. Of the whole 238 married cases 96 had never given birth to a living child, 56 had borne but one child, 29 two, 18 three, 14 four, 8 five, 8 six, 4 seven, 3 eight, and one each had ten and twelve children.

3. *Abortion* is extremely common in this malady, due to either coexisting endometrial or uterine disease, or to the impregnation of an unhealthy ovum incapable of full development. In no less than 53 cases was the pregnancy preceding the time of coming under observation an abortion. In some of these, no doubt, the miscarriage acted as the originating cause of the oöphoritis; in fact, in 23 instances the patients traced back their malady to this accident. But in the majority the abortion was dependent upon previous ovarian inflammation. Of all the married women, 87, or 36.5 per cent of all, or 51.5 per cent of the parous women, miscarried once or more, the total number of abortions being 137—54 women aborting once, 20 twice, 10 three times, 2 four times, and 1 five times. This gives an average of 0.57 for all, or 0.81 for the parous only. The following table presents a very good idea of all these facts, as also the relation of full-time children to abortions:

Children.	Abortions.						
	0	1	2	3	4	5	Total.
0	68	19	6	3	..	..	96
1	37	15	2	2	..	..	56
2	20	7	1	1	..	..	29
3	11	2	3	1	1	..	18
4	4	7	3	..	..	..	14
5	5	..	2	1	..	..	8
6	3	1	2	..	1	1	8
7	2	2	..	..	..	..	4
8	1	1	1	..	..	..	3
10	..	..	..	1	..	..	1
12	..	..	..	1	..	..	1
Total	151	54	20	10	2	1	238

4. *Superinvolution.*—This is among the rare results of oöphoritis, but that it does occur there is no doubt. First described by Simpson, it has remained in great part an unexplainable condition up to the present time, its causes especially continuing among the medical mysteries which remain to be unravelled. According to Simpson it is "produced when the disintegrating process that is set up after delivery goes on to such an excessive degree as to reduce the organ (uterus) to a size decidedly below its normal dimensions in the unimpregnated condition."[1] He considers it of comparative rarity. Frommel, however, found 28 cases among 3,000 gynecological cases presenting themselves at the Berlin Polyclinic—that is, in about 0.9 per cent—but admits that it is more frequent in public than in private practice. Barnes and Fordyce Barker are among those who consider the disease far from uncommon; while Tait, A. Reeves Jackson, and H. P. C. Wilson believe it to be exceedingly rare. Of true superinvolution—that is, that form dependent upon labor at term or miscarriage—I have met with 15 examples among 5,262 gynecological cases, of whom 4,594 were married women. Of these latter 3,690 had been pregnant before coming under observation. We thus have superinvolution occurring in only 0.28 per cent of all genital cases, or in 0.33 per cent of married women, or, what better expresses the exact truth, 0.41 per cent of fertile women, showing it to be only about half as common here as in Berlin, according to Frommel's statistics. Schröder has distinguished three forms: one occurring in the beginning of the puerperal state, particularly in tuberculous women, but also in those ill with puerperal fever; 2, that taking place in anemic, badly nourished women who have nevertheless passed through a normal confinement and puerperal convalescence; 3, a very marked form following puerperal disease, either after primary destruction of the parenchyma of the ovary (in peritonitis) or after serious disease of the uterus itself (septic endometritis). It is easy to understand how in the first and the last forms ovarian disease may occur. Tait was, I believe, the first to call attention to the fact that atrophy of the ovaries, or rather atrophic oöphoritis, "is sometimes associated with atrophy of the uterus, resulting in what is known, and was first described by Simpson, as superinvolution of the uterus." Hart and Barbour refer to

[1] Works, vol. iii., p. 597.

pelvic peritonitis as a cause, occurring during the puerperium. "This," they say, "can produce, we know, atrophy of the ovary through binding it down with adhesions; and atrophy of the ovaries may lead to atrophy of the uterus." Another fact: We know also that uterine atrophy follows, as a rule, removal of both ovaries. Simpson, in the case he quotes in his book, found the ovaries much atrophied and smaller than natural, with tissue dense and fibrous, and presenting no appearance of Graafian vesicles. Tait is of the opinion that the disease is due to supervention of some form of febrile disease upon the puerperal state, such as the zymoses, mentioning a case where scarlatina appeared during the first week of the puerperium of a second labor. He saw the patient seven years later, and she had never menstruated again and her uterus was perfectly infantile. "Looking backward," he says, "on this case and others, and aided by the evidence of other facts referred to under the head of exanthematic ovaritis, I am led to believe that superinvolution is explained by the occurrence of inflammation, followed by atrophy, during the puerperal month; and that the uterus merely follows in the steps of the ovary, carrying the process further, however, because it had been already in action, and stopping it only when, perhaps, there was no more muscular tissue left to absorb."

The essential condition necessary to produce superinvolution is that the oöphoritis occurring during the puerperal month, whether secondary to peritonitis or due to puerperal or the essential fevers, as scarlatina, variola, and the like, shall involve the Graafian follicles. This, as we have seen, as pointed out by numerous authorities, especially Slavjansky, is characteristic of the oöphoritis complicating the exanthemata and other infectious diseases; while ovarian atrophy due to compression by contracting adhesions also induces secondary destruction of the follicles. The ultimate result is disappearance of the vesicles, atrophy of the glands, and cessation of function, with secondary consecutive atrophy of the uterus, hastened by the normal process of involution which is going on in the organ.

5. *Uterine Atrophy.*—Just as superinvolution may depend upon two forms of oöphoritis for its production—that where the Graafian vesicles are primarily affected, and that where the follicular involvement is secondary to a peritonitis, or rather peri-oöphoritis—so may true atrophy of the uterus, independent

of the puerperal state, follow these conditions. Its occurrence is even rarer than the former, having come under my notice but seven times as against fifteen cases of superinvolution. Five times it followed the infectious diseases and twice it depended upon a previous pelvi-peritonitis. The former cases have already been referred to under the head of etiology. The two peritonitic cases are herewith given.

Rebecca H., æt. 45 years, married twenty-one years, widow since three months. Never pregnant. Began to menstruate at the age of 13 years; was always absolutely regular, the flow continuing three days, with great pain during its continuance. At the age of 38 years she was operated upon for the relief of her sterility, following which she had an attack of peritonitis. Since that time she has never menstruated. The uterus was found small and atrophic; the ovaries could not be discovered, but on the right side there existed the remains of an old peritonitis.

Ottilie O., æt. 38 years, married seventeen years, and a widow since two years. Had one child ten months after marriage. Began to menstruate at the age of 19 years; was always perfectly regular in every respect. Three years before presenting herself, had an attack of pelvic peritonitis, following which her menstruation failed to reappear for two years. Since one year, at long intervals, she has had a faint show; now none for five months. Uterus was found in the normal position, but decidedly diminished in size. Ovaries could not be felt, but some old, sensitive masses persisted on the right side of the pelvis.

TREATMENT.—Three plans of treatment are available to us in the management of these cases of chronic oöphoritis: (1) medical, (2) surgical, and (3) electrical.

Up to within a comparatively few years medical measures were the only ones known in the combating of the disease; but the almost universal verdict was that such means were inadequate, for but few cases were cured, a few only relieved, while the large majority remained absolutely unaffected by treatment. The means resorted to were very many, and their multiplicity but served to indicate the uncertainty regarding the proper means to be employed and the doubtfulness of results. When seen early a few cases might be entirely cured or perhaps relief given; later on, when profound changes had taken place in the ovaries, failure was the almost invariable result. "Now a few words on the treatment," says J. Matthews Duncan in a

lecture on ovaritis, "and I begin by telling you that you will find a great many cases chronic, which is almost a synonym for incurable. I advise you, indeed, in many cases which resist a properly conducted treatment, to give up the attempt at cure. You will only bother your patient, make her a valetudinarian, and do her harm by further persistence in attempting to cure a disease which proper treatment has failed to remove." And this advice by a pure clinician, one whose mainstay was medical measures and not the knife.

Among the many remedies resorted to were counter-irritants in the form of blisters, tincture of iodine, issues, and irritating ointments; baths, both general and local; alteratives, absorbents, and sedatives; rest; avoidance of coitus; leeches; various forms of enemata; suppositories; applications to the vagina; and an endless list of internal medicines given with various objects. The poor patient was dosed *ad nauseam* and blistered to the verge of endurance without avail; so that, added to the suffering entailed by her disease, she had the discomforts, to express it mildly, produced by the treatment carried on for months and months. Following the advice of the text books, I also have inflicted such torture upon my patients in my early practice, only in time to have them leave me, disgusted with the measures employed, as well as dissatisfied with the small amount of benefit derived. A glance over the progress of medication in the management of these cases during the last five years, as given in *Sajous' Annual of the Universal Medical Sciences*, shows that practically no actual advance has been made; tampons of various forms and materials, bismuth, iodoform, ichthyol, mercurials, iodide of potassium, sedatives, hot vaginal douches, and massage constituting in great part the means resorted to, differing therefore in no essential respect from the management of cases by physicians of a past generation. Yet, commenting on diseases of the appendages in the very *Annual* from which the above remedies were extracted, the editor of the department of "Diseases of the Ovaries and Tubes" (Goodell) remarks: "Very little can be said as to the medical treatment of disease of the appendages. It has been dogmatically stated that no treatment other than surgical can be of any relief, yet we are forced to admit that the treatment by drugs and local applications is usually unavailing, although this is due in part to the fact that we seldom see these

cases early enough in the disease."[1] And this is the opinion of a markedly conservative man. Medical treatment thus resolves itself, then, into two classes: those seen early where a cure is possible, and those met with later on when medicine offers little or no hope of a cure, and but slight even of simple relief. Medicine being thus confessedly a failure—for almost all cases present themselves late on in the disease—a natural result, in this truly surgical age, was a resort to the knife. At first this was done with hesitation, then with precipitation, till finally it almost seemed that there was but one remedy for oöphoritis, especially when combined with tubal disease, and that was operation. However, the reaction has set in, and surgeons are now trying to determine the proper indications and limitations of operative interference. Writing in the *British Medical Journal*, 1887, Dr. Thomas More Madden warmly attacks the operation for removal of the ovaries. "Oöphorectomy," he says, "is now suggested as the panacea for all ills from which unfortunate women suffer, and their ovaries are removed with as much impunity as the butcher spays his cows, and with the same consideration for the wishes of the patient." Emmet is of those who believe that the value of Tait's operation is very much more limited in its application than its author would have us believe. Of late not a few of those who were formerly warm advocates of oöphorectomy are beginning to doubt the advisability of frequent resort thereto, and even to question the ultimate beneficial results in many cases. Thus Lusk writes in a paper,[2] read before the Congress of American Physicians, September, 1891: "The more the question is studied the more clear it becomes that the loss of her ovaries does make a difference to a woman. It is time to echo in this country Doléris' cry in France: 'Too many useless mutilations; not enough conservative gynecology.'" The late Charles C. Lee, in a subsequent paper[3] read before the New York Obstetrical Society—really an appendix to Lusk's paper, 26 of his cases having been incorporated in the essay of the latter—wrote that the sentiments of many of the speakers, reflecting, as they did, a feeling of more or less profound disappointment with the results of laparatomy, had convinced him that something must be radically wrong, and that an evident necessity

[1] Sajous' Annual, 1889, p. F., 8.

[2] American Journal of Obstetrics, November, 1891, p. 1306.

[3] American Journal of Obstetrics, November, 1891, p. 1370.

existed for the clearer demarcation of cases appropriate and inappropriate for operation. Taking these 26 cases of Lee's, which had been kept for a long time under observation after operation, we find 15 which may be considered to have been completely or comparatively successful, 7 that were only partial successes, and 4 that were absolute failures. The absolute relief of pain, often only, however, after one or two years' persistence to a greater or less degree, was brought about in 16 instances, relief was never more than partial in 8 instances, while in 2 the decision must be that practically no abatement at all was obtained. In 21 of these cases there was some form of oöphoritis or ovarian descent, and, taking pain as the pivotal symptom, in 11 there was complete cessation after a time, and in 10 only partial relief of this symptom. Not a very flattering showing for so radical and dangerous an operation as celiotomy. In the discussion following the reading of this paper of Dr. Lee's, conservatism seemed to be the keynote of most of the speakers. Doléris [1] believes that eight-tenths of the women operated upon have submitted needlessly to mutilation. Having the best of opportunities for seeing a large number of gynecological cases, he (Doléris) has come to believe conservative treatment is usually more successful than the radical operation in the cure of pelvic inflammations. "The latter," he says, "may be justifiable for myoma and encysted abscess of the tubes; but when constantly undertaken for follicular ovaritis, catarrhal salpingitis, for pelvic neuralgia, and real or pseudo-hysteria, the subject will bear a little investigation." Mundé, in a paper [2] on the "Conservative Treatment of Salpingitis," remarks: "But I believe the time has come when it is well for those of us who are doing abdominal work habitually and as a matter of our almost daily routine, to take the field against the hasty and habitual removal of the uterine appendages simply because they happen to be more or less diseased." In the discussion following the reading of this paper at the New York Academy of Medicine, remarks were made strongly indorsing the views of Dr. Mundé, and not a dissenting voice was heard. All these cries for conservatism but indicate the disappointments following operative interference. Were celiotomy fraught with but slight danger to life, did it offer a sure cure in every case or even in a large

[1] Nouv. Arch. d'Obst. et de Gyn., July and August, 1891.

[2] AMERICAN JOURNAL OF OBSTETRICS, July, 1892, p. 2.

percentage of the cases of oöphoritis, did it leave nothing behind it, and were there no substitutes, it might be considered the treatment of election in every case. But, as matters now stand, the results are not brilliant, symptoms often going unrelieved, in some instances aggravation rather occurring; new symptoms are developed, especially those referable to the nervous system; and accidents follow, such as fistulæ, herniæ, and the like, all of which go to make the life of the patient more miserable than before the operation. Even where recovery occurs the result is often long in appearing, months and even years intervening before the cure is apparent. Thus in not a few of Lee's cases, where the verdict must be ultimate cure, the symptoms persisted for two years after operation, disappearing only gradually. The surgeon loses sight of his cases and takes to his soul the belief that he has wrought a cure. But in not a few cases this is far from the truth. Instances are being constantly met with in our dispensaries of patients who are no better, are even worse, after the operation, and more than once have I heard them curse the day when they were prevailed upon to submit to the surgeon's knife. Thus it has been my fortune to meet with 31 cases in the large majority of which undoubted failure, up to the time of presenting themselves, must be scored against the operation of celiotomy; most of these patients having been operated upon by some of the best known and cleverest specialists in New York City. Pain was often unchanged or aggravated, nervous symptoms instituted, herniæ developed, sleepless nights followed days of suffering, appetite gone, and life rendered miserable, and all this after submitting to an operation at the risk of life. Life jeopardized, result *nil*. Truly it is an unpleasant reflection. If I have met with so many cases, others must have done likewise. How large, then, must be the total in our own city alone no man can tell. I know I am treading on dangerous ground, that criticism is a thankless task that but makes enemies for us; but abuses must be met and controverted, and errors corrected, no matter on whom the blame may fall. It is not claimed that celiotomy is a failure in the majority of cases. Far from it, for many patients are undoubtedly entirely relieved of their sufferings, where proper care in the diagnosis and selection of cases is exercised. Even in the hands of the best operators, however, there are not a few failures, but how many it is impossible to determine. We have seen how dubious were the results in

many of Lee's carefully followed cases, there being 57.7 per cent of cures, 26.9 per cent of relief, and 15.4 per cent of failures. Skene Keith reports in 23 operations 19 cures, 2 failures, and 2 instances of improvement only. Kepplar in 46 operations met with 39 cures. Boldt in 112 operations had 58 cures, 10 failures, 24 where improvement only was obtained, and 11 that were either not heard from or in which insufficient time had elapsed to note results; besides, among these 112 cases there were 8 deaths. Taking these results of Boldt as a standard, and leaving out of consideration the 11 undetermined cases, we have a percentage of cures of only 58 per cent, of failures 10 per cent, a further 24 per cent were only partially successful, while the actual death rate was 7.1 per cent—a rather poor showing for so radical and dangerous an operation as celiotomy. Again, Dr. John Williams, in a discussion[1] before the Obstetrical Society of London held October 5th, 1892, maintained, and he was not contradicted, that "in so far as he could gather from the most reliable statistics, about thirty per cent of patients from whom diseased appendages were removed were cured by operation, many more were benefited and cured by time and other treatment, while the rest continued to suffer."

On pages 538 to 542 are the cases I have met with. They but serve to indicate the frequency of failure. Year after year the number of such patients seems to increase. The enthusiastic and sanguine operator reports his 100 or 200 cases operated on, expatiates upon his small death rate, holds long disquisitions upon the technique of the operation—but usually fails to tell us what finally became of his cases, and whether or not the ultimate result was cure of symptoms with the removal of their supposed pathological causes. The final results of cases are extremely hard to get at, hence any of us who may meet with such are in duty bound to report them, so that our Fellows may judge for themselves.

But if it be true that medicine offers but slight hopes of a cure, and that surgery can cure but little more than a half of all, and this after great risk to life and only after months of subsequent suffering, must we go on in the old way, or is there something better to offer? Medically there is nothing; but in electricity, more especially in galvanism, we have an agent which may be truly said to be the ideal remedy for such a disease as

[1] American Journal of Obstetrics, March, 1893, p. 445.

No.	Age.	Time since operation.	Operation.	Menstruation.	Pelvic pain.	Condition of pelvic parts.	Remarks.
1	29	6 months ..	Both ovaries.	None	Unchanged	Uterus right latero- and retroverted, somewhat fixed. Pelvis excessively sensitive. Vaginal vault thickened.	Suffers as much now as before operation. Complains of severe pain all over pelvis, and expresses regret that she permitted operation, as absolutely no benefit has followed. Pain has been so great that patient has been unable to sleep for four months.
2	30	2 years	Both ovaries.	None	None	Uterus atrophied, adherent anteriorly. Entrance to vagina small, appearing as in a woman after menopause. Considerable pain felt at introitus on pressure anteriorly.	Suffers from headache, constipation, and states that it seems impossible for her husband to obtain entrance in attempts at coitus. Has a profuse leucorrheal discharge.
3	26	3 years ...	Left ovary	Regular	Unchanged	Uterus anteverted. On the left side a sausage-shaped, sensitive mass of painful exudation.	Remained under observation four years, with unchanged symptoms and local lesion, suffering all this time. No dyspareunia. Is now well, having finally been cured by galvanism, the pelvic exudation disappearing entirely. Has an abdominal hernia.
4	51 Single.	1 year.....	Both ovaries.	None	None	Uterus right retro-lateroverted, atrophic. Nothing felt in pelvis.	Indication for operation, menstruation every two weeks; none since. Now suffers from headache, nervousness, inability to work, and has a sensation as if there was a lump in the abdomen. Suffers also from dyspnea and pain in chest, but has no pulmonary trouble.
5	40	19 months..	Both ovaries.	The first time 7 months after operation. Irregular since, varying from 3 weeks to 3 months. None since 4 months.	Considerable of late.	Uterus low and anteverted, movable, large, firm. A point of tenderness just above the umbilicus.	General condition pretty good. Slightly anemic. Indication for operation, recurring peritonitis.

6	33	10 months..	Left ovary	Regular	Considerable.	Uterus retroverted and large; chronic cervical catarrh; subinvolution. On the left side, low down, a soft, sensitive mass, continuous above with a boggy mass continuous with the uterus.	Is excessively anemic. Suffers from sleeplessness, and has a chronic diarrhea. Dyspareunia so severe that it prevents all intercourse.
7	27	2 years ...	Left ovary	Irregular ...	None	Uterus anteverted; bilateral laceration and eversion. Chronic cervical catarrh.	Since operation feels much better, but does not consider herself entirely well.
8	24	11 months..	Both ovaries.	Has frequent loss of blood.	Greater....	Uterus in normal position, etc., but firmly adherent.	Has not been benefited in the least so far. Is now as bad as ever, in fact says she is worse. Has greater pain and more free loss of blood.
9	28	7 months ..	Both ovaries.	None.....	None.. ...	No examination	Is very anemic, but otherwise well.
10	43	5 months ..	Both ovaries.	Regular at first; of late irregular.	Very severe	Uterus retroflexed, adherent. On the right side and posteriorly a firm, sensitive mass.	Has a tremendous flow of blood at each appearance, lasting eight days. Complains of pain in the abdomen and back, especially the latter, which is so severe that she feels like fainting. Also complains of vertigo. Does not think operation has so far benefited her.
11	27	5 months ..	Both ovaries.	Regular	Greater....	Uterus retroverted, large, and soft; bilateral laceration and eversion.	Felt a little better at first, but now feels as bad as ever.
12	21	1 year.....	Both ovaries.	Regular	Slightly diminished.	Uterus normal. On the right side a mass, the size of a walnut, firmly adherent to the uterus at the cervico-corporeal junction, very sensitive.	Feels slightly improved, but has almost as much pain as formerly over the left side. Has great dysmenorrhea during the flow, also has flushes, flashes of heat, and great nervous excitement and trembling, with palpitations. Sleep disturbed by dreams.
13	25	2 years ...	Both ovaries.	None.....	None.....	Uterus in normal position, but atrophic; movable.	Suffers from frequent flushing of face and neck, headaches; constipation, going from two to three weeks; nausea, vomiting, loss of appetite. Celiotomy was done without her consent or knowledge.
14	42	8 months ..	Left ovary	Too frequent	Considerable.	Uterus retroverted and low (at vulva), large, firm; bilateral laceration; eversion.	Felt better for a while, but of late feels much worse than ever before.

No.	Age.	Time since operation.	Operation.	Menstruation.	Pelvic pain.	Condition of pelvic parts.	Remarks.
15	25	3 years ...	Right ovary.	Regular	Unchanged	Uterus in normal position. Chronic cervical catarrh. On the left side some thickening in the broad ligament; very sensitive to pressure.	Felt no better after operation, nor has she improved since. Pain has persisted unchanged.
16	25	2 years	Both ovaries.	None.....	Great.....	Uterus anteflexed, atrophic; some slight exudation on the left side, sensitive. Vagina narrow and smooth. External genitals very senile-looking.	Feels worse since operation, and is getting worse and worse. Never felt as bad as at present. Suffers from great pain in the back, great constipation, loss of appetite, and weakness. Dyspareunia intense only since operation, and almost entirely preventing coitus.
17	26	4 months ..	Left ovary	Regular	Great.....	Uterus in normal position and but slightly movable. Behind uterus some firm, hard, sensitive exudation covering in Douglas' sac; some on the left side.	Felt somewhat better for five weeks, but since is much worse than ever. Is very weak and anemic. Suffers constantly from pain in the abdomen and back. Defecation is extremely painful and accompanied by loss of blood.
18	18	6 months ..	One ovary (?).	Regular ...	Considerable.	No examination	Is very anemic, costive. Has intense pain during menstruation. Felt better for about five months, but since one month has a free discharge, with abdominal and back pain.
19	23	4 months ..	Right ovary.	Every three weeks since operation.	Great.....	Uterus normal. Some soft exudation in right broad ligament and posteriorly.	Has had great pain since operation, none at all before. Was not benefited, but rather made worse; sleep poor; menstruation preceded and accompanied by intense pain, and this only since operation.
20	18 Single.	6 months ..	Both ovaries.	None.....	Considerable.	Uterus normal. Pelvic parts extremely sensitive. Scar five inches long, very sensitive and angry-looking.	Felt better after operation for one month, and since then as bad as ever. Has burning pain in back and abdomen, frequent cramps, considerable pain over region of ovaries, with occasional dragging pains over left side. Frequent urinary trouble, requiring catheterization for a week at a time. Has a very free yellow discharge. Is very nervous and excitable. Headaches. Frequent flushings. Appetite poor.

21	24	11 months..	Both ovaries.	None.....	None.....	Normal, but atrophic	Has peculiar nervous symptoms: chills followed by great warmth, flushings, intense headaches followed by paleness, and says she acts as if insane.
22	28	2½ years....	Both ovaries.	Three times after operation; none since.	At times as bad as ever.	Normal, but atrophic.....	Pain remained absent until six months ago; since, occasional recurrence as bad as ever. Now feels no better than before operation. Suffers frequently from epistaxis. Is anemic. Has flashes of heat over back and abdomen, especially on the right side. Also has nausea mornings.
23	34	Two operations. First 8 years, second 2½ years.	Both ovaries.	Regular, but since a few months every two to three months.	Terrible ...	Uterus left lateroverted. A somewhat flattened, soft, sensitive mass, size of a walnut, in Douglas' sac. Uterus large, firm.	Suffers intensely from abdominal pain. Pain with defecation so great that she avoids it. Suffers from flushings, headache, nausea, dysmenorrhea. This patient's tortures were at times indescribable, yet so set was she that she preferred death to a third operation for the removal of the mass behind the uterus.
24	23	2 years	Both ovaries.	None.....	Great.....	Normal, but atrophic.....	Was operated upon without her knowledge or consent. Husband, on hearing that she could bear him no children, deserted her. Has continual pain in lower abdomen. In every respect feels worse since operation.
25	32	8 months ..	Right ovary.	Irregular ...	Great.. ...	Normal condition of uterus. Great pain on pressure over right ovarian region, less on the left.	As long as she keeps quiet, feels well, but the slightest amount of work causes great suffering. Is extremely nervous. Complains at times of great distention of the abdomen. Feels absolutely no improvement.
26	28	7½ years....	Left ovary	Irregular ...	Great.....	Uterus normal. A very painful area over left side; along right tube also great sensitiveness.	Is very hysterical. Sleeps but little. Complains of constant pain over the left ovarian region and intermittent over the right side. Has frequent flushings, headaches, confusion of ideas, etc. Felt better for some time after operation.

No.	Age.	Time since operation.	Operation.	Menstruation.	Pelvic pain.	Condition of pelvic parts.	Remarks.
27	44	1½ years....	One ovary (?).	Regular.....	Great.....	Uterus in normal position, firm, hard; bilateral laceration.	Felt well at first, but of late is worse than before. Has great pain, cramp-like in character, over the abdomen, with great, continuous pain in the back. Has an abdominal hernia at the lower part of the incision.
28	19	2 months..	Left ovary	Regular.....	Great.....	Uterus normal. On the left side slight pressure is agonizingly painful. Broad ligament shortened on this side, and very sensitive to very slight pressure.	Felt a little better at first, but now as bad as ever. Extremely anemic. Has pain over region of uterus. Great pain with defecation since operation only, and is very costive. Was not informed she was going to be operated upon, and had no idea what was going to be done when she was placed under an anesthetic.
29	19	6 months..	Both ovaries.	Has menstruated twice.	Unchanged	Uterus anteverted, movable. Right ovarian region painful on pressure.	Feels absolutely no better, having still the same pain over right side and in back as before. Pain now extremely severe. Bowels irregular, defecation painful.
30	27 Single.	2½ years...	Both ovaries.	None.....	Great... ..	Uterus drawn over to the left side and somewhat fixed. Left broad ligament shortened. Uterus atrophied. External genitals senile-looking. Introitus very narrow, hardly admitting finger.	Felt somewhat easier at first, but was never free of pain. Of late suffers from intense abdominal pains. Has frequent headaches and nausea, frequent chills and flashes of heat, severe flushings. Great thirst and free perspiration at night. Is extremely nervous, also has confusion of ideas. Has great pain over whole abdomen.
31	34	6 months..	Both ovaries.	None.....	None.....	Uterus normal in size, shape, position, etc. Behind uterus, between it and the rectum, some sensitiveness.	Indication for operation, hysteria. Was not benefited a particle. Still has tremblings, palpitations. Is extremely nervous, just as before removal of the ovaries. Bowels regular, but has great pain during defecation. Urination frequent.

chronic oöphoritis. Properly used, it is absolutely without danger, can be resorted to without causing any special pain to the patient, is readily applied, is almost sure to give relief in every case, and in many brings about a perfect and permanent cure. Its only drawback is that it requires considerable time to produce curative results, six months, and even longer, being sometimes consumed. But oöphorectomy, even where it really cures, frequently does not do so until one or two years after the knife has been used have passed. Besides, where the electricity has been employed we always still have the radical measure to fall back on if the former should happen to fail. Of course I am well aware that it has been claimed that the previous use of electricity renders the operation far more difficult. But this I doubt. Electricity of late years has been used to a considerable extent in our large cities, yet laparatomists, especially those who condemn this agent, are constantly boasting, year after year, of their diminishing death rate. Were the difficulties increased a natural result would be increased mortality. So far I have treated quite a large number of cases of oöphoritis with electricity, and have yet to meet with my first accident. Properly employed, it is absolutely without danger; judiciously and not indiscriminately resorted to, it offers almost perfect hope of a cure. Relief is often very rapid, cure not so rapidly wrought. Patients often are surprised at the extreme rapidity with which their pains are dispelled, so much so, in fact, in quite a number of cases, that, considering themselves cured, it was almost impossible to induce them to continue treatment, although the ovarian lesion still persisted, though to a modified degree. Symptomatic cure, therefore, is often rapid, though pathologic cure is not so quick to follow.

Not more bitter was the opposition to the introduction of ovariotomy as a surgical procedure than is that now being urged against electro-therapeutics in the treatment of the diseases of the female genitalia. It is indeed the irony of fate that a measure which finds its principal exponent in France should develop some of its most violent opponents in the United States, where ovariotomy may be said to have taken its rise. For in France it was that the most bitter objectors to ovariotomy were found, the operation being there violently condemned and characterized as "*une audace Américaine*" (Piorry), "an indication of foolishness and an act of madness" (Velpeau), as "a rash proceeding"

(Cruveilhier), as "an operation that should be placed among the prerogatives of the executioner" (Moreau). To-day, in spite of these wholesale denunciations by the best minds among the French surgeons, there is no operation in the whole field of surgery which stands on firmer ground than this very one of ovariotomy. Certainly to-day among the most bitter opponents of electro-therapeutics in gynecology are the very men who are strongest in their support of operative procedures on the female genitalia. The defenders of yesterday are the aggressors of to-day. Electricity must fight its battle with the gynecological surgeon. Nor is this surprising, for it invades the very territory which he has come to consider as his very own, attempting, as it does, to curtail the field of operative interference. Formerly we heard much of "meddlesome midwifery" and "belly ripping"; now it is "meddlesome gynecology" or "uterine tinkering." Let a physician read a paper on electro-gynecology, and he is at once characterized as a meddler and a tinkerer, and informed that he is doing no good, but rather making the work of the surgeon far more difficult and using up valuable time. I can do no better than quote the following àpropos words from an article by Dr. Wallace Briggs:[1] "'Meddlesome gynecology' and 'uterine tinkering' are getting to be set phrases with those who seek to envisage gynecology as a branch of operative surgery. Emerson I believe it was who said, in substance, that one truth cannot be stated strongly without doing injustice to some other truth. But the surgical exclusivists are not content with stating their truth strongly, but stoutly maintain that there is no other truth. The blind spot that Holmes says is normal to all of our brains no longer remains with them a spot merely, but invades whole convolutions, if not the entire anterior lobe of the cerebrum. For them the 'sensitiveness' of the uterus exists as a reality instead of a myth, like 'sensitiveness' of the peritoneum, dissipated by cleanliness and antiseptics. By their 'damnable iteration' many of us have come to believe that the knife constitutes our entire gynecologic armamentarium. In consequence, abdominal surgeons, like the men of Roderick Dhu, spring from every cover, fully equipped to do the liveliest execution. I protest against this opinion and this practice. I deny that it is the *summum bonum* of woman to be relieved of the intrinsic insignia of her sex. We are, indeed, too often reduced to

[1] Medical News, January 21st, 1893, p. 65.

the sad and humiliating necessity of such mutilation, and so are we to that of amputation of legs and arms; but the world believes that amputations are to be averted rather than courted, and so it will soon believe of celiotomies. It is no less the duty of the physician to obviate the necessity of sacrificial operations than to perform them when indicated."

It is nothing new to treat oöphoritis by electricity, nor do I claim anything new in the mode of application or in apparatus. What I do claim is to have given the method a fair, impartial, and exhaustive trial in a large series of cases, with results that are extremely satisfactory. So far I have treated 65 cases of chronic oöphoritis, either simple or most often complicated, by means of electricity, either in the form of the direct constant current or of the induced current, giving in the large majority of the cases, however, the preference to the former form of the agent or force. The cases were never selected, but were taken in regular order as they presented themselves, the only contra-indicating conditions considered being the presence of acute inflammation anywhere in the peri-uterine tissues, the existence of pus, and later on, as experience increased, the presence of old, unyielding adhesions when widespread. Otherwise no other complications were deemed sufficiently important to indicate the withholding of this agent.

As to mode of application, the method I have employed here differs in no essential respect from that recommended in a previous paper on "Induration following Pelvic Cellulitis," published in vol. xxv., No. 3, 1892, of THE AMERICAN JOURNAL OF OBSTETRICS. The same rules and precautions there enunciated govern here also. The battery, the milampèremeter, the rheostat, all come into play, and no application should be made without the aid of all of these instruments.

A brief résumé of means and methods is best, however, here given. The battery should consist of a galvanic and a faradic apparatus. The former had best be made up of sixty elements, either the original Leclanché cell or one of its many modifications, the one preferred by me, however, being the so-called "Gonda," on account of its great durability and the slight attention required to keep it up to its work. These are connected in series to a current selector, allowing us to use any or all, as we may prefer. The faradic apparatus is run by four similar elements, so arranged also that one or all may be thrown

into the circuit, in this way allowing us carefully to regulate the amount of induction of our coils. The best for our purposes is the Engelmann battery as made by the Waite & Bartlett Manufacturing Company, and as usually combined in their cabinet batteries, that from the finest wire, the current of tension, being the one invariably resorted to in chronic oöphoritis, the object always being the relief of pain, this current being markedly sedative in its properties.

The milampèremeter may be any of the standard instruments, while the rheostat to be preferred above all others is the Bailey as lately modified. Of this instrument I cannot speak too highly. Months of its use have but served to increase my good opinion of it. Until I had obtained one of these I had tried many forms of current controllers, but all proved unsatisfactory, until at last the old style of Bailey instrument was resorted to. This proved reliable, but yet had a number of disadvantages. The "New Bailey," it seems to me, is a perfect instrument for our purposes, allowing us to regulate the current to a nicety, never playing us any tricks, and requiring but little care to keep it in good working order. In fact, by it we are enabled to turn on current with such accuracy that a fraction of a milampère may be added or withdrawn by a slight turn of the thumbscrew. The electrodes are comparatively few: the dispersion pad for the external pole, a clay-ball electrode for vaginal use, and a platinum sound for intra-uterine use. This for the galvanic current. For the faradic we need in addition a bipolar vaginal and a bipolar intra-uterine electrode. The dispersion electrode preferred by me is that made of felt, as described in the *Medical Record*, January 14th, 1893, on account of its great durability, ease of handling, and readiness for use, as well as its cleanliness. However, if preferred, other dispersion electrodes, as the Apostoli, the Martin, or the many others in the market, will do equally as well. The clay-ball electrode should consist of a block-tin ball centre firmly welded to the staff, a layer of clay over this, and a piece of oil-tanned chamois to cover in the whole. The advantages of this modified clay ball over the old style, which had a carbon centre and cheese cloth outside, are twofold. The carbon is apt to soften up and loosen in time, and at some critical moment separate from the shaft and thus shock the patient. This accident has happened to me. Again, the clay, with the constant soaking, gradually oozes out

through the cheese cloth, until finally nothing but the centre is left. Neither of these things can happen with the modified clay ball. One so made has been in constant use for fully a year and is still absolutely as good as the day it was made. The platinum sound is that ordinarily employed. The bipolar electrodes are those of Apostoli; that for the uterus, however, I have had made flexible, so as to facilitate its introduction.

Now as to the method of application. In the beginning of the case it is often advisable to resort to faradism, for the reason that pain is the symptom which usually brings the patient to us, and its early relief is therefore of prime importance. This faradism will frequently rapidly overcome, and thus the confidence of our patient will be gained. However, as a rule I immediately begin the use of galvanism, for I have found that it also will give great relief to pain in these cases, and besides at the same time will set the absorbents at work in the cure of the disease. Faradism relieves simply, galvanism cures. So at best the former is only of transient use, serving only to overcome a symptom. Where faradism is used, either the intra-uterine or vaginal form of bipolar electrode may be employed, the former being preferable, the fine coil with extremely fine interruptions being best, the séance lasting for from ten to twenty minutes, according to the severity of the pain. Do not use too strong a current of induction; keep it within the bounds of comfort. Unfortunately we have no means for measuring accurately the dose of faradism, the only method at our command being the millimetre scale placed at the side of the coils. This is a very rude method indeed, but it is all we have at present. Measured in this way, I generally give from 30 to 50 units of this scale. Sometimes, instead of using the bipolar electrodes, I have resorted to either the clay ball in the vagina or the platinum sound in the uterus, the external pad being placed anteriorly on one side or the other, or posteriorly, according to the seat of the disease and the position of the ovary, in this way passing the faradic current directly through the diseased organ.

Galvanism is preferable in the large majority of cases, even from the very beginning, producing as it does sedation, quickening the circulation, stirring up the absorbents, and possibly also effecting some degree of electrolysis. In the beginning the rule is to give the preference to the positive as the active or internal pole, as we need its sedative qualities; later on, where

pain is diminished, the negative or absorbent pole is to be substituted and persevered in to the end, unless there be return of pain, when it may be temporarily replaced by the positive. Generally the clay ball is introduced into the vagina up to the vault, right or left or posteriorly, as near to the affected ovary as possible, for the reason that we then have only the thin vaginal walls between it and the ovary, more especially if the latter be descended, thus bringing the diseased organ more directly under the immediate control of the curative agent. Where uterine disease is prominent, however, the platinum sound is introduced into the cavity of the uterus, thus enabling us to treat both the uterine and the ovarian disease simultaneously. As soon as the former has disappeared, the latter persisting, the vaginal method is to be substituted.

Where the disease is rather recent, from 50 to 75 milampères are to be given for from five to seven minutes; where, however, it is of long standing and the changes in the affected organs are profound, 75 to 150 milampères are administered, the sitting continuing for from three to five minutes, never longer. Of course all ordinary precautions are to be carefully observed, such as antisepsis, regulation of exercise afterward, etc.

The dispersion electrode generally is placed over the lower abdomen, scars, blemishes, and abrasions being carefully protected, while bony prominences are avoided. Where, however, the ovary is displaced downward and backward, it is a good idea to place the pad over the sacrum, thus obtaining a direct passage of the current through the affected organ.

The duration of treatment varies greatly. If the cases are recent, one to two months is sufficient to bring about a cure; if of long standing, six months and even a year are consumed in bringing this about. But this is nothing when we recall that months and years pass under simple medical treatment, frequently without any result whatever; while surgery, which jeopardizes life, actually requires for from one to two years after operation before the cure manifests itself in not a few cases. In electricity we have a remedy which is absolutely without a particle of risk, which does in six months or a year what medicine fails to do, and what surgery can only do in twice that period with greatly added suffering and dangers. The method is not painful; can be readily applied in our offices; allows the patient to go about her business afterward, subject,

of course, to the usual limitations of caution; does not confine her one instant to bed; requires no special preparation; and offers the best hopes of recovery. So far as I know, it has absolutely no drawbacks, and if it unfortunately fails, as it sometimes must do—for where is the plan of treatment that does not?—it still leaves to the patient the final arbitrament of the knife.

Now as to results. Where treatment occupies considerable time it is often difficult to induce patients to persist therein long enough to bring about a cure. Often they are satisfied with relief and cease attendance before they are entirely well, even when urged to the contrary. Again, in some cases they feel so free of symptoms that they consider themselves cured, although informed that they are not so, but, thinking so, they consider it foolish to persist in treatment. The cases, therefore, naturally divide themselves into two general classes—those where treatment was persevered in to the end, and those where it was abandoned before positive results one way or the other were obtained. Besides these there are a number of cases still under treatment; of the total of 65 patients there were 25 cases where the management of the case was completed, 32 where it was abandoned too soon, while 8 are still attending. Of the first group 22[1] were cured, and in only 3 was there a failure to relieve. Of the second class 27 were steadily improving up to the time of the abandonment of treatment by the patient, and in only 5 instances was there no relief; of the 8 now being submitted to this plan of treatment, all so far have been more or less benefited. This showing is far better than any form of management yet submitted to the medical profession, and time and increased experience but serve to increase my confidence therein. Of course I am well aware that the "personal factor" influences our verdicts in matters in which we are specially interested; but this is certain, that a fair, unbiassed, persistent trial of electricity in the management of cases of chronic oöphoritis will be rewarded with results that will be more than satisfactory. Failures undoubtedly there will be, but the cures will be many, relief will be rapid, and this, as over and over again stated, without any risk whatever to our patient. Not a few of my cases had previously submitted to various plans of treatment at the hands of many physicians, but without avail. Some had been advised to

[1] See table on pages 550 to 555.

No.	Social condition.	Age.	Number of children.	Number of abortions.	Last confinement.	Duration of illness.	Symptoms.	Physical examination.	Duration of electrical treatment.
1	Married 7½ years	27	2		3½ years.....	3½ years	Nausea; emesis; painful defecation; pain over back and ovaries; great dyspareunia; too frequent menstruation, with great dysmenorrhea; general debility.	Retroversion; subinvolution; chronic endometritis. Right ovary in Douglas' sac, large, smooth, very sensitive.	6 months ..
2	Single. ..	31				Recent..	Pain over abdomen; irregular, free menstruation; great dysmenorrhea; abundant greenish discharge.	Anteflexion; chronic endometritis. Right ovary in Douglas' sac, large, firm, smooth, sensitive.	2 months ..
3	Married 16 years	34	4	1	5 weeks; an abortion.	Long standing	Great pain over left side and down left thigh; intense pain during defecation; irregular, free menstruation; leucorrhea.	Uterus in normal position, large, firm; bilateral laceration; eversion. Left tube thickened. Left ovary enlarged, sensitive, in Douglas' sac.	7 months.
4	Married 4 years	27		1	3½ years; an abortion.	4 years...	Great pain over left ovary; great dysmenorrhea; dyspareunia; painful defecation; dysuria.	Retroversion; chronic endometritis. Left ovary in Douglas' sac, large, firm, sensitive.	5 months ..
5	Married 2 years	24	1		1 year.....	1 year....	Irregular, frequent menstruation; dysmenorrhea; pain over left ovary and in back.	Retroversion: chronic endometritis. Left ovary very sensitive and enlarged.	2½ months.
6	Married 11 years	30		1	10½ years; an abortion	2 years..	Irregular menstruation, small in quantity; pain over right ovary; dyspareunia.	Retroversion. Uterus somewhat adherent. Right ovary descended into Douglas' sac, enlarged, painful, adherent to uterus slightly.	2 months ..
7	Married 12 years	32	1	1	10 years; an abortion.	10 years .	Great pain in lower abdomen; leucorrheal discharge.	Chronic endometritis. Along the left tube considerable thickening. Left ovary enlarged. Along tube and ovary considerable pain on pressure.	4½ months
8	Married 1 year, widowed 5 years.	25	1		5 years	5 years...	Dysmenorrhea; pain over back and ovaries; leucorrhea; pain on walking.	Left lateroversion; chronic endometritis. Right ovary enlarged and very sensitive. Right tube somewhat dilated.	2 months ..

Séances.	Range.		Average.		Form of application.		Condition of parts at end of treatment.	When last seen after cure.	Remarks.
G.	F.	G.	F.	G.	F.	G.			
11	40 mm.	40 to 120 ma.	40 mm.	70 ma.	Bipolar intra-uterine.	Negative, vaginal.	Ovary still in Douglas' sac, of normal size and shape; no longer sensitive. Uterus normal in size and shape, but still retroverted.	2 years.	After cessation of treatment became pregnant after an interval of 4 years since last confinement. One month ago was again confined. All her symptoms have disappeared. Gained in flesh and was able to attend to her work—something formerly impossible.
9		50 ma.		50 ma.		Negative, vaginal.	Ovary still in Douglas' sac, not enlarged nor firm; no more than normal sensibility. Uterus in normal position. No longer any endometritis.	8 mos..	All symptoms gone. Married after cessation of treatment, and immediately became pregnant. Last seen when 7 months advanced, and expressed herself as feeling perfectly well.
30		50 to 100 ma.		60 ma.		Positive vaginal, positive intra-uterine, negative vaginal.	Ovary in normal position, no longer sensitive or enlarged. Tube no longer thickened. Parts about uterus perfectly insensitive.		Menstruation became regular, all pain disappeared. Became able to earn her own living. In fact, felt perfectly well.
23		30 to 70 ma.		50 ma.		Positive intra-uterine, positive vaginal, negative vaginal.	*Examination under chloroform.*—Ovaries, tubes, and uterus absolutely normal.	7 mos..	Considered herself perfectly well when treatment was stopped. When last seen continued so.
13		40 to 75 ma.		55 ma.		Positive intra-uterine, positive vaginal, negative vaginal.	Absolutely normal condition of parts external to uterus. Slight cervical catarrh only.		Expressed herself as feeling perfectly well when treatment was stopped.
10		50 to 75 ma.		55 ma.		Positive intra-uterine, positive vaginal, negative vaginal.	Slight retroversion. Uterus normal to feel every way. Ovary in normal position and normal to feel; no pain on pressure.	1¼ yrs..	All uterine symptoms had entirely disappeared; felt perfectly and absolutely well. Trouble followed an attack of pelvic peritonitis. Remained well when last seen.
18		60 to 100 ma.		75 ma.		Negative vaginal.	Parts perfectly normal.	9 mos..	Removal of ovaries had been recommended. Entirely free of all symptoms. Walks and works without trouble of any kind. No leucorrhœa. Remained well when last seen.
9		50 to 100 ma.		60 ma.		Positive vaginal, negative vaginal.	Normal every way.		Felt perfectly well at end of treatment No discharge, no pain; able to attend to her work (that of a canvasser), which keeps her on her feet constantly, without a particle of trouble. Had been informed at two institutions that an operation was necessary.

No.	Social condition.	Age	Number of children.	Number of abortions.	Last confinement.	Duration of illness.	Symptoms.	Physical examination.	Duration of electrical treatment.
9	Married 10 years	36	3	1	3 months; an abortion.	Recent...	Pelvic pain; irregular, free menstruation; leucorrhea; bad general condition.	Retroversion. Left ovary large, low down in Douglas' sac, sensitive.	6 weeks....
10	Married 5 years, widowed 3 weeks.	30	3		20 months....	Recent...	Pain over both ovaries; back pain; painful defecation; leucorrhea.	Chronic endometritis; retroversion; bilateral laceration; eversion. Left ovary descended in Douglas' sac, enlarged, firm sensitive.	2 months..
11	Married 5 years	28	2	3	8 months....	5 months	Pain over right ovarian region; back pain; pain in hips.	Chronic endometritis. Right tube thickened and painful to pressure. Right ovary sensitive.	7 months..
12	Married 8 years	28				2 months	Intense dysmenorrhea; severe pain over left ovary, rendering walking impossible.	Anteversion. Left ovary slightly enlarged, but exquisitely sensitive.	2½ months.
13	Married 5 years	23	3		23 months...	22 mos. ..	Great pain over both ovaries.	Retroversion; chronic endometritis. Right ovary in Douglas' sac, enlarged and sensitive.	2 months..
14	Married 7 months	21		1	5 months; an abortion.	5 months	Great dysmenorrhea; pain over right ovary; dysuria.	Anteflexion. Right ovary enlarged and very sensitive.	2 weeks....
15	Married 16 years	32	2		12 years.....		Copious menstruation; back and pelvic pain; dysuria; leucorrhea; dysmenorrhea.	Anteflexion; chronic endometritis. Right ovary enlarged and very sensitive.	3 months .
16	Married 7 years	46	1	2	5 years... ...	5 years...	Dysmenorrhea; irregular, free menstruation; pain over left ovary.	Chronic endometritis. Left ovary enlarged and sensitive.	2½ months.
17	Married 6 years	32	2		2 years.....	2 years...	Irregular, free menstruation; great dysmenorrhea; burning pain over right ovary.	Retroversion, areolar hyperplasia, bilateral laceration, and eversion. Right ovary large, firm, painful on pressure.	1 month...

...mber of séances.		Range.		Average.		Form of application.		Condition of parts at end of treatment.	When last seen after cure.	Remarks.
...	G.	F.	G.	F.	G.	F.	G.			
...	13		50 to 75 ma.		70 ma.		Negative vaginal.	Uterus retroverted. Ovaries normal in every respect.	5 mos..	Free of all symptoms referable to genital organs. When last seen complained only of back pain, due to the retroversion. Relieved by a pessary. Ovaries then perfectly normal.
...	14		65 to 75 ma.		73 ma.		Negative vaginal.	Uterus retroverted, otherwise normal. Ovaries normal in position and in condition.		All symptoms gone; general health excellent. No pain. Was under treatment for months before electricity was begun, but steadily grew worse.
....	23		75 to 180 ma.		135 ma.		Positive vaginal, negative vaginal.	Parts perfectly normal.		Trouble followed an attack of pelvic peritonitis; thickening of the tube was considerable, and did not disappear until high powers were resorted to. The ultimate result was a perfect cure. Has remained well.
....	22		80 to 100 ma.		75 ma.		Positive vaginal, negative vaginal.	Examined under chloroform; parts perfectly normal.	1½ yrs..	Had been advised to have ovary removed. Her suffering was something terrible, and absolutely prevented her from following her vocation, that of a danseuse. All symptoms vanished. She returned to the stage and has remained well.
....	8		75 ma.		75 ma.		Negative vaginal.	Retroversion; parts otherwise perfectly normal.		Trouble followed an attack of pelvic peritonitis following labor. Is perfectly well and able to attend to her work, which is very hard.
....	4		50 to 75 ma.		70 ma.		Negative vaginal.	Parts normal.	8 mos..	Continued perfectly well. When last seen was about 2½ months pregnant, and expressed herself as feeling absolutely well.
....	10		75 ma.		75 ma.		Positive vaginal, negative vaginal.	Uterus and ovaries normal in every respect. A little cervical catarrh only.	1 year..	Continued well when last seen.
....	14		60 to 75 ma.		70 ma.		Positive vaginal, negative vaginal.	Parts perfectly normal in every way.	13 mos.	Was under treatment a long time previously without any benefit. Continued well when last seen.
....	6		75 ma.		75 ma.		Positive vaginal negative vaginal.	Ovaries perfectly normal to feel. Suffers only from chronic endometritis.	10 mos.	All pain gone. When last seen examination showed ovaries to be normal in every respect Uterus of normal feel and in normal position. Suffered only from cervical catarrh.

No.	Social condition.	Age.	Number of children.	Number of abortions.	Last confinement.	Duration of illness.	Symptoms.	Physical examination.	Duration of electrical treatment.
18	Married 9 years	27	1	1	4 years.....	4 years...	Great dysmenorrhea; pain over left ovary; leucorrhea; painful defecation; dysuria.	Retroversion. Left ovary painful, slightly enlarged.	11 months..
19	Single....	20				6 months	Intense dysmenorrhea; irregular, free menstruation; back pain; pain over both ovaries; costive; greenish discharge.	Retroversion; chronic endometritis. Cervix adherent to anterior vaginal wall. Right ovary very sensitive.	7 weeks....
20	Married 14 years	33	1		12 years...	3 months	Great pain over right ovary; dysuria; debility.	Anteflexion: chronic endometritis. Right ovary low down, smooth, sensitive, enlarged.	2 weeks....
21	Married 11 years	33		1	10 years; an abortion.	2 years...	Dysmenorrhea; painful defecation; great pain over left ovary; difficulty and pain in walking.	Anteflexion. Both ovaries enlarged and extremely sensitive; left low down in lateral pouch.	2½ months.
22	Married 7 years	30	1		6 years.	6 years ..	Great pain in back and over right ovary.	Retroversion. Right ovary enlarged and extremely sensitive.	3 months..

submit to operation, but had declined, this advice being given more than once by well-known specialists in this branch of surgery. Yet such cases were, with few exceptions, either rapidly relieved or permanently cured, greatly to the astonishment of the patient, who could but make invidious comparisons between the new and the old—comparisons not flattering to surgery, and which spoke volumes favorable to electricity. Of course general measures where indicated were not neglected, especially the administration of tonics, for the patients usually were in a greatly debilitated state.

Very few of these cases made uninterrupted recoveries; pain would for some time be absent entirely, only to recur on some indiscretion; menstruation might become perfectly regular, but occasionally the previous irregularity and dysmenorrhea would

Séances.	Range.		Average.		Form of application.		Condition of parts at end of treatment.	When last seen after cure.	Remarks.
G.	F.	G.	F.	G.	F.	G.			
28	22 to 40 mm.	75 to 150 ma.	33 mm.	100 ma.	Bipolar intra-uterine: fine coil, fine interruption.	Positive vaginal, negative vaginal	Ovary perfectly normal every way. Uterus in normal position and of normal feel Passage of sound into uterus causes considerable pain just as it is passing the internal os—a pain, she says, which is exactly like that of menstruation.	3 mos..	Her ovarian functions became perfectly normal, and have continued so. The hyperesthetic condition of the internal os, however, continues, but is steadily diminishing under intra-uterine galvanization.
7	45 mm.	75 ma.	45 mm.	75 ma.	Bipolar intra-uterine; fine coil, fine interruption.	Positive vaginal.	Ovaries perfectly normal every way.	4 mos..	Absolutely free of pain when she ceased attendance. Remained so when last seen. When following heavy work had a recurrence, for which she is now being treated.
2		75 to 150 ma.		110 ma.		Negative vaginal.	Normal every way.	4 mos..	All symptoms rapidly disappeared. Remained entirely well in every respect when last seen.
20		65 to 80 ma.		70 ma.		Positive vaginal, negative vaginal.	*Examination under chloroform.*—Ovaries normal. Cervix divulsed at same time.	1 year .	Perfectly well every way when treatment was stopped, and has remained so. Now pregnant 4½ months. In this case also removal of the ovaries had been recommended by a well-known specialist.
10		50 to 100 ma.		75 ma.		Positive vaginal, negative vaginal.	Parts normal every way.	5 mos..	Had been under treatment by several physicians without any relief. Has remained well.

return temporarily. One symptom which almost invariably remained permanently absent after it had once vanished was dyspareunia. The patient's general condition also usually steadily improved. Intercurrent ailments always had a bad effect upon the symptoms, for on such occasions they almost invariably recurred, though never with their former intensity, and then only to again rapidly disappear on continuance of the treatment. The ovarian disease itself, though rapidly modified, was not so quick to disappear as the rational symptoms it produced. But almost from the beginning of treatment there was steady modification and improvement in the local lesion; sensitiveness diminished; the ovary became continuously smaller and smaller until it reached its normal dimensions, and, if descended, as a rule it steadily rose up to its normal position, though there were

a number of exceptions to this rule, the ovary remaining down but otherwise becoming normal to the touch. Most of the cases were seen and examined months after the cessation of treatment, and remained well in spite of hard work and a return to their old mode of life, which was generally one of hardship. A number of these patients had been advised to have their ovaries removed, and in every case at some well-known institution or by some well-known specialist. It will be noted that four of these cases became pregnant—something which the objectors to electricity claim cannot occur after the use of this agent on the female genitalia.

I have deemed it best to give in full the histories of the cases of failure, so that each one can judge for himself, and also because from such cases more is often to be learned than from our successes.

Minnie K., æt. 20 years, born in Poland, married one year; one child, a male, fourteen weeks before coming under observation. Had always been perfectly healthy. Labor, which was normal, was followed by an attack of pelvic peritonitis and cellulitis. Presented herself April 8th, 1890. At that time was suffering greatly from back pain and pain over the lower abdomen; bowels costive; urination frequent and painful, and had a free vaginal discharge; general condition bad.

The uterus was found retroverted (first degree) and large, while the cervix was bilaterally lacerated and everted, and gave exit to a free mucous discharge. Posteriorly to the uterus, and extending over toward the right side in the broad ligament, was a mass of firm, sensitive exudation rendering the uterus somewhat immovable. Various plans of treatment were tried during eight months without any result whatever, so on December 2d galvanization was begun.

December 2d: Galvanism, 50 milampères, 5 minutes. Negative vaginal. No pain a half-hour later. Dec. 6th: Galvanism, meter out of order, 5 minutes. Went without pain for one day, but this has recurred since as bad as ever. Dec. 16th: Galvanism, 60 milampères, 5 minutes. No better. Dec. 20th: Galvanism, 60 milampères, 5 minutes. Feels somewhat better. Dec. 23d: Galvanism, 75 milampères, 5 minutes. But little pain, and that only on the left side. Dec. 30th: Galvanism, 50 milampères, 5 minutes. Again has considerable pain. Mass can no longer be distinctly mapped out, though pressure near

the uterus is extremely painful, especially toward the left side. Decided diminution in the amount of exudation.

January 3d, 1891: Galvanism, 50 milampères, 5 minutes. Expresses herself as feeling decidedly better. Jan. 13th: Galvanism, 50 milampères, 5 minutes. Menstruation about normal in quantity and almost free of pain. Complains still of pelvic pain. Less leucorrhea than formerly. Jan. 15th: Galvanism, 50 milampères, 5 minutes. Says, all in all, that she feels no better. Jan. 20th: Galvanism, 50 milampères, 5 minutes. No better. Exudation gone, but there is felt low down and adherent to the uterus on the left side a fluctuating mass the size of an egg, round, smooth, and exquisitely sensitive. Recommended operation.

February 20th, 1893: Patient was lost sight of until the foregoing date. Was operated upon February 5th, 1892, in one of our large hospitals, about one year after she had been advised to this step. According to the history of the operation, some difficulty was experienced in bringing out the tubes and ovaries. The left tube and ovary were bound down by adhesions, and as these were broken up some bloody serum escaped, leading to the belief that the ovary had been the seat of a cystic hematoma which burst during manipulation. The right tube and ovary were also bound down, and the adhesions were also broken up. The patient made an uneventful recovery and left the hospital March 11th, 1892. When seen by me, about one year later, she stated that she felt somewhat improved, but still had almost as much pain as formerly over the left ovarian region; menstruates regularly, and has great dysmenorrhea during the flow; suffers from flushings, flashes of heat, and great nervous excitement and trembling, with palpitations; sleep disturbed by unpleasant dreams; urination painful, the pain occurring at the end of the flow of urine.

Uterus normal in size and shape, position and mobility. On the right side a mass attached firmly to the uterus at the cervico-corporeal junction and somewhat posteriorly. This mass is extremely sensitive, irregular in shape, and of the size of an English walnut.

It will be observed that this was an extremely complicated and difficult case to manage; that the electricity was tried only for a brief period, that it caused the disappearance of the pelvic exudation, and in so far was of value, as it thus aided in clearing

up an otherwise obscure diagnosis; and that operation as yet, one year after, is almost as much if not more of a failure than the galvanization. Were such a case again to appear, I am of the belief that persistent recourse to electricity would ultimately bring about at least relief, and possibly a cure. Operation so far has not proved itself superior to electricity in this case.

Minnie H., æt. 40 years, German, widow since ten years, married five years; has had but one child, about one year after marriage. Menstruates regularly, amount small, but suffers from intense pain during the flow. Complains of great back pain and severe pain over the left ovary. Bowels costive, defecation painful; dysuria. Is forced to earn her living by washing. Uterus retroflexed (second degree) and firmly bound down. Both ovaries sensitive to pressure and also firmly adherent. Was operated upon nine years ago for cervical laceration. Felt well after this. Three years ago the late Dr. Hunter attempted to remove her ovaries, but was forced to abandon the operation. She was told that absolutely nothing was removed, on account of the dense adhesions of all the pelvic parts. Presented herself September 10th, 1890. Patient received in all 21 applications of positive galvanization, vaginal, during five months, varying in strength from 75 to 150 milampères, an average of about 95 milampères, with temporary relief at times, but absolutely no permanent benefit, the parts at the termination of treatment being exactly the same as when it was begun. On one occasion she menstruated without a particle of pain, the first time in years; on another occasion with but little pain. Her back and pelvic pains diminished at times, but never entirely disappeared, recurrence on working hard being the invariable rule. For years she had visited the Woman's Hospital without any relief whatever. When I began galvanization she was informed that electricity would probably do her no good, but she begged a trial of it. Finally her pains became so great that she determined to have herself again operated upon, no matter what the result, preferring death to a continuance of her sufferings. Since then she has not been seen.

Here we have a case abandoned as inoperable by one of New York's most expert laparatomists. More universal or firmer adhesions I have never seen. My own better judgment told me that no permanent good was to be expected from electricity. But as everything else had been tried without success, and the

patient was anxious to have a trial of this, the attempt was made, with the expected result—failure. That such old adhesions can be melted down by any method of treatment at our command, whether massage or electricity, is more than doubtful. Failure in such a case argues nothing against electricity. Since then several such cases have presented themselves, but, as nothing was to be hoped for, no resort was made to the agent. Old adhesions, especially when unyielding, constitute a strong contra-indication to the treatment by electricity.

Rosa B., æt. 23 years, married one and one-half years, never pregnant. Began to menstruate at the age of 15 years; always regular. Of late almost continuous loss of blood, though the amount lost is very small; some leucorrhea; pain over both ovaries. Dates her trouble back to the time of marriage; immediately thereafter had a free vaginal discharge and irregularity of menstruation.

Uterus retroflexed (first degree) and left lateroverted; movements curtailed. The uterus is somewhat enlarged, 2¾ inches in depth; external os, which is small, gives exit to a free discharge. Posteriorly and attached to the uterus, and moving with it, an irregular, soft, somewhat sensitive mass of the size of a walnut; not otherwise adherent. The mass is felt on the right side just above Douglas' pouch, and undoubtedly is an adherent, inflamed right ovary. Left ovary perfectly normal. This patient was first seen July 28th and various plans of treatment tried without any success. So on October 6th, three and one-half months later, electricity was for the first time resorted to, the parts still continuing as above.

October 6th: Galvanism, 75 milampères, 5 minutes. Negative vaginal. Dispersion electrode posteriorly. Oct. 20th: Galvanism, 75 milampères, 5 minutes. Oct. 25th: Galvanism, 75 milampères, 5 minutes. Pain slightly less.

November 29th: Galvanism, 100 milampères, 4 minutes. Positive intra-uterine substituted for the negative vaginal. Felt somewhat better, but since two weeks again constant slight oozing of blood.

December 1st: Galvanism, 120 milampères, 10 minutes. Still bleeding. Dec. 3d: Galvanism, 150 milampères, 5 minutes. No bleeding since last séance. Dec. 6th: Galvanism, 150 milampères, 5 minutes. Only a very faint show of blood, but considerable leucorrheal discharge. Only slight pain. Dec.

8th: Galvanism, 170 milampères, 5 minutes. Some slight bleeding still. Dec. 17th: Galvanism, 200 milampères, 5 minutes. Again bleeding freely. So far patient has practically not been benefited at all. Failed to return after this last visit. In this case there had undoubtedly been a pelvic peritonitis, most likely gonorrheal in its origin, which had bound down the uterus in loose adhesions and fixed the right ovary firmly to the former organ. As before said, old adhesions have in my experience been unbenefited by electricity, and their existence in this case no doubt accounted for the failure to relieve.

There remain only for further consideration the cases where the patients abandoned treatment. Of these there were 32 instances, in only 5 of which had relief failed to follow. None of these cases, however, are fair tests of the treatment; nor could they under ordinary circumstances be claimed as failures, for none of them followed up treatment long enough to determine anything. Thus one received only two applications in three weeks and then ceased attendance; a second had five administrations in three weeks and then remained away; a third submitted to three sittings in six days and then absented herself; a fourth had three séances and then failed to return; while a fifth received but one application in all. These cases, however, are given with the object of completing the list of cases treated and allowing an impartial judgment by all as to its true value. Besides these 5 instances of too early abandonment there were 27 other cases where treatment was not followed up long enough to decide whether or not a cure was being actually brought about. In every one of these, however, more or less marked relief was obtained, and many expressed themselves as very well satisfied with what had been so far accomplished. The class of cases from which these patients were mostly drawn are notoriously negligent of their health, and will rarely pursue treatment long enough to permit a positive cure to be effected. Yet most of them, observing relief early, continued their visits during quite a long period, especially for them, where electricity was employed; longer, in fact, than under any other plan of treatment ever tried by me. Nevertheless when improvement had reached a certain point, judging only by their own sensations, they considered themselves cured and could not be brought to understand why they were urged to persist in their attendance, and as a result quite a number ceased their visits when they felt well.

From time to time some of them have reappeared for the treatment of some other ailment, when it has been found by examination that the previously diseased parts had become normal. For it is a peculiarity of galvanization that it sets up healthy action in the chronically inflamed ovaries, which frequently continues after all applications have been stopped, until the parts have returned to their natural condition. Therefore it is very likely that in a fair percentage of these cases of voluntary abandonment a cure will be ultimately established. Only a few days ago, for instance, one such patient reappeared after a year's absence, simply to inform me that in the meanwhile she had continued perfectly well.

In addition to the foregoing there are still eight cases under treatment, and, as they have all so far been markedly benefited, the prospects of an ultimate cure are very bright.

Considering only the instances of completed treatment, we have 25 cases, of whom 22, or 88 per cent, were cured. Of the 3 cases of failure, 2 were submitted to operation, 1 previous to and the other after the trial of electricity. Surgery could not reach the first, and so far in the second instance, where galvanism failed, celiotomy also has failed. This latter case, it is my honest belief, would ultimately have been relieved, if not cured, by a further persistence in the use of galvanism; but as the patient's sufferings were great, and I then did not have the confidence in the agent that I now have, she was recommended to subject herself to an operation; so far, however, over a year after, without any real benefit. The third case is really the only one of downright failure. Hence we may fairly conclude that for the cure of chronic oöphoritis there is no remedy now before the profession which is the equal of electricity; the cure being obtained without any risk whatever to the patient, be the case simple or complicated, recent or of old standing, the only contra-indications being the presence of pus, the occurrence of acute peri-uterine inflammation, or the existence of old, unyielding adhesions.

126 East 82d Street.

A NEW PELVIMETER.

BY

JAMES B. BULLITT, M.D.,
Louisville, Ky.

(With one illustration.)

In presenting this instrument to the consideration of the profession at large, and more especially of those members of it who are particularly interested in obstetrics and gynecology, I can only claim to have made use of ideas evolved by Skutsch.[1]

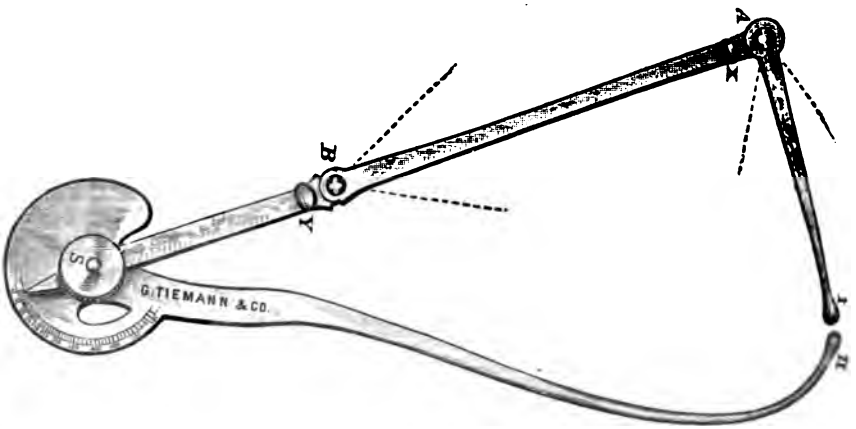
The Skutsch instrument has one long curved arm, designed to be introduced within the pelvis through the vagina, and one pliable arm made of lead. The method of using this Skutsch instrument is as follows, it being desired, for instance, to ascertain the true conjugate diameter of the pelvis: The patient being placed on the back, with knees and thighs flexed, a mark is made on the skin in the median line, corresponding to the upper border of the symphysis pubis. The curved arm is now introduced into the vagina, the concavity looking to the rear, and the point is placed on the promontory of the sacrum under guidance of two fingers. The point of the lead arm is now brought to the mark over the symphysis, the bar keeping the position given it. By a suitable mechanism this arm is now liberated and thrown back, so that its position will not be interfered with while withdrawing the instrument. The instrument is now withdrawn, the pliable bar returned to its place, and the distance measured between the two points. This distance represents exactly the true conjugate *plus* the thickness of the wall through the symphysis. It becomes necessary then to ascertain this thickness. The curved bar is reversed, the concavity looking toward the symphysis, and the point, guided by the index finger, placed within the vagina on the upper border of the symphysis, opposite the mark on the skin. The point of the pliable arm is now placed on this mark as before, released, withdrawn, and the distance indicated subtracted from the first

[1] Vide Deutsche medicinische Wochenschrift, 1890, No. 13.

measurement. The resulting value is the true conjugate. Next it is desired to get the transverse diameter of the outlet—the distance between the inner borders of the tuberosities. The patient is placed on her back, one leg and thigh flexed, the other extended—we will say the *right* flexed and the *left* extended. The curved bar is now introduced into the vagina, the concavity looking toward the *right* of the patient. The point, under the guidance of two fingers as before, is placed on the inner border of the right tuberosity. The point of the pliable bar is placed over the great trochanter of the left femur; the arm is released, the instrument withdrawn as before. The distance between the points represents the true transverse diameter of the outlet *plus* the thickness of the wall between the inner border of the left tuberosity and the great trochanter of the left femur. To ascertain this thickness the instrument is reversed and the curved bar introduced into the vagina, the concavity looking toward the left tuberosity of the patient. Under guidance the point is placed on the inner border of the left tuberosity; the point of the pliable arm is placed over the trochanter as before. The distance so obtained is subtracted from the first measurement, the result being the true transverse diameter of the outlet. This system of measuring is most accurate, the measurements being always within a small fraction of the true values. But with the Skutsch instrument there are two sources of possible error. The pliability of the lead arm permits deviation laterally from the plane of the curved, stiff arm; and, secondly, the elasticity of the lead arm is a constant menace to absolute accuracy. In order to make the point remain in contact with the skin it is necessary to press it into the skin, making an indentation; the elasticity of the arm will then probably make the point just remain in contact with the skin. I say *probably;* it is somewhat dependent on the thickness of the pad of adipose tissue, and still more dependent on the nicety of each individual operator. This error may be anywhere from a quarter to one centimetre, as determined by actual experiment. I first had the pleasure of seeing the Skutsch instrument used while serving in the Rotunda Hospital in Dublin. It occurred to me it would easily be possible to remedy the only two faults of the Skutsch instrument, and this I have done by substituting a *stiff, jointed* arm for the pliable lead arm. The original model was made in Dublin, and has

now been in use in the Rotunda Hospital for something more than a year. Dr. W. J. Smyly, master of the Rotunda Hospital, is good enough to write me that he has used this pelvimeter in the Rotunda for some months past, and that he has been very much pleased with it. With the very courteous and efficient assistance of Messrs. Tiemann & Co. this original model has been very much improved, and I believe the accompanying cut represents an instrument which fulfils its purpose perfectly.

This instrument has the further advantage that it is designed for external measurements also. It is, in fact, a combined and improved Baudelocque-Skutsch instrument. When the movable end piece of the jointed arm is at about a right angle, the spring



X snaps into place, the two points I and II are in contact, and the instrument is a simple pelvimeter for external measurements, distances between the points being read off in centimetres on the scale. In making internal measurements the instrument is used quite like the Skutsch. The curved bar is introduced into the vagina, and the point I of the jointed arm is placed externally over the mark made on the skin. The screw S is then screwed down fast, the clip Y pressed down, and this jointed arm released and thrown back at the joint B. The curved arm is then withdrawn from the vagina, the jointed arm snapped back into place at B, and the distance between the points I and II measured. If the operator finds it more convenient, he can note the position of the pointer on the scale and throw the whole arm back, instead of releasing its upper part at the joint B; the instrument is then withdrawn from

the vagina, the pointer returned to the position it occupied, and the distance between the points measured as before. The two arms turn completely around, reversing the instrument, for the first and second measurements. The jointed arm can be thrown back in both directions at B, the spring Y snapping into place when the central member is exactly in line with the basal. In conclusion, the joints permit of ready dismemberment and cleansing. By disjointing at B the instrument is rendered very portable.

Just at present accurate pelvic measurements are of the utmost importance to determine as between the possibility of natural labor and the operation of symphysiotomy, and, on the other hand, as between the possibility of successful symphysiotomy and Cesarean section.

In conclusion, I cherish the hope that this instrument will be found to fill a want, and in a way that no preceding instrument has been able to do.

CORRESPONDENCE.

"A CASE OF ABSCESS OF THE VERMIFORM APPENDIX," ETC.

To the Editor of The American Journal of Obstetrics, etc.

Dear Sir:—In the account of the Transactions of the Chicago Gynecological Society, published in this Journal August, 1893, page 265, a paper entitled "A Case of Abscess of the Vermiform Appendix closely Adherent to Rectum and Right Tube, associated with Double Pyosalpinx; Removal of Sac and Appendage; Recovery," is credited to me, that belongs to Dr. Reuben Peterson, Grand Rapids, Mich.

I read this paper for Dr. Peterson in the discussion of Dr. Fenger's paper on "Appendicitis." The items in the discussion that I wished to emphasize were:

1. There is no sufficient difference in structure to account for the alleged greater frequency of appendicitis in the male than in the female.

2. Appendicitis does occur in the female, and is sometimes the source of infection of the pelvic peritoneum and connec-

tive tissue. I have observed the vermiform appendix glued to the right Fallopian tube. Dr. Bayard Holmes, some months since, showed a wandering appendix that perforated the descending colon; this, it is true, occurred in a male. I have had under observation one case of general peritonitis in a woman that I thought originated in diseased appendages, but that exploratory laparatomy demonstrated to be due to perforative appendicitis.

3. Sufficient attention was not paid to tuberculous appendicitis.

Please correct the error, which was due to my own carelessness, and believe me to be,

Very faithfully yours,

W. W. JAGGARD.

2910 INDIANA AVENUE, CHICAGO,
August 22d, 1893.

TRANSACTIONS OF THE CHICAGO GYNECOLOGICAL SOCIETY.

Meeting of May 19th, 1893.

The President, E. J. DOERING, M.D., *in the Chair*.

By invitation of the Society DR. BOERNE BETTMAN read a paper on

THE RELATION BETWEEN THE EYES AND DISEASE OF THE FEMALE GENITAL ORGANS.[1]

DR. F. BYRON ROBINSON.—I have not very much to say on this subject, because I do not know very much about it. I have had quite a number of cases among young women who had menstrual disorders, and uterine disease, so far as I could see, from menstrual disorders, and they had bad vision; and these I recommended to oculists, and every one, so far as I recollect, has been benefited by wearing glasses. A little while ago Dr. Wurdeman, of Milwaukee, in response to a pamphlet I sent him in regard to disorders of the uterus and diseases of the eyes, says: "I note your point about weak eyes with pelvic disorders in young girls. The trouble is due in a few cases to disturbances in the general circulation, in others the accommodation seems to be weak; but it is on account of the general

[1] See original paper, p. 498.

neurasthenic state of these patients that they are affected by a small amount of refractive or muscular disturbance which in healthy persons would not produce any eye strain. The cure of these patients rests with the gynecologists."

I feel quite sure there is a connection between diseases of the viscera and diseases of the eye in those women who are so much worse at menstrual periods, when the congestion of the pelvic viscera takes place; and although I have not done very much with it, I have done enough to find that the nervous connection between these is absolutely enormous. The sympathetic goes from the superior cervical ganglia, through the foramen in the base of the skull, along the plexus to the eye, and behind the eye is quite a large ganglion too. Although I cannot find much in the literature about it, I feel sure there will be a considerable future to the question of the connection between irritation of the viscera and eye trouble, it makes no difference whether it be in the pelvis, liver, or the kidney. The eye is a very delicate organ, and the more complicated an organ is the more trouble the reflexes give it.

Dr. Boerne Bettman, in closing the discussion, emphasized the fact that there is no pathognomonic symptom which makes its appearance in the eye that can be attributed to any particular disturbance of the female genital organs. It seems natural that the eye should participate in derangements of the uterus and ovaries, just as well as the stomach or liver or any other organ of the body should participate in those derangements.

Dr. Joseph B. Bacon read a paper on

THE RELATION OF SOME RECTAL DISEASES TO GYNECOLOGY.[1]

Dr. F. Byron Robinson.—The doctor mentioned one point which is a confirmation of the idea that gonorrhea is a most extensive disease—that is, that gonorrhea exists and thrives in the cylindrical epithelium. It will exist in the eye, the vagina, and in all glands that are connected with the vulva and tubes. If one will watch he will see that these gonococci go up into the rectum and there exist in the cylindrical epithelium—there is the starting point of disease. The business of the gonococci seems to be to brush off the epithelium and go down into the connective tissue, and there they stay, and the reflex comes up to the abdominal brain and back to the uterus, and keeps up the inflammatory irritation. For a long time nothing has been said about the gonorrhea creating strictures in the rectum; it was all syphilis. But I will guarantee that strictures in the rectum are often from gonorrhea, because of the chances the woman has of infection. Clinics demonstrate that women suffer ten times more from rectal stricture than men. It is my opinion that it

[1] See original paper, p. 504.

will finally be accepted that many rectal strictures are from gonorrhea.

Dr. W. S. Christopher.—I would like to ask Dr. Bacon whether rectal disease is a prominent feature in the production of leucorrhea in little girls, and if it accounts for the long continuation of that trouble when once established. These cases have bothered me a great deal. I meet a large number of them, and confess that I have had very little success in their management. I am in hopes that Dr. Bacon may be able to throw some light on these cases.

Dr. Newman.—I have but one remark to make, and that is in the nature of an objection to the theory here advanced, beautiful as it is. I refer to Dr. Bacon's idea of the possibility of retroversion being produced in the manner he describes.

If inflammation is set up in the cellular or connective tissue around the utero-sacral ligament through infection, we should expect, not backward, but forward displacements, either flexions or versions. Contraction of the connective tissue in this locality would produce shortening of the utero-sacral ligament and drawing up of the uterus at its cervico-corporeal juncture, thus tilting the fundus forward either in the position of anteflexion or anteversion.

Dr. J. B. Bacon, in closing the discussion, said: In answer to Dr. Christopher's question, the theory I suggested was, where there was no pathological condition existing in the uterus or appendages, or the vagina was not diseased so as to cause irritation, then we should look for the reflexes; it must be a reflex from some other organ. In the first place, pus should be examined to see if it contains gonococci. I do not care whether it is in an infant or not, because many of the servant and nurse girls have gonorrhea for a long time, and without doubt many times they infect the infants in changing their napkins, etc. Then there should be examination made through the rectum to see if you can find any foreign body in the vagina, and, if necessary, examine the vagina under an anesthetic; and if we cannot find it in that way, then we should look into the rectum for some disease. Of course it is possible to be a reflex from some other organ.

As to Dr. Newman's idea, this shortening at the lower end of the uterus might produce anteflexion; but if at the middle of the uterus, where there is frequently inflammation that causes a local peritonitis in the pouch of Douglas, then you may have a cementing together of that, and it may be where the peritoneum is reflected back to the rectum and the utero-sacral muscle; then if that undergoes a fibroid degeneration with contraction, it is almost certain to produce retroposition.

By invitation of the Society Dr. Archibald Church read a paper entitled

REMOVAL OF THE OVARIES AND TUBES IN THE INSANE AND NEUROTIC.[1]

DR. SANGER BROWN.—While in the Bloomingdale Asylum for the Insane I was through at least one epidemic of removal of the appendages for insanity. I was living in New York when Dr. Gill Wylie—quite an eminent gynecologist there, and I presume well known to many of you—discovered, or thought he discovered, that the treatment of the uterus and appendages, with their removal when diseased, would cure a very large percentage of cases of insanity. He did not limit this treatment to any particular kind of insanity, and, indeed, he enumerated nearly every possible form of uterine disease as being fit subjects for him to operate upon and cure. I believe he got permission from the commissioners to operate on a considerable number of the insane in Blackwell's Island Asylum. And, like all specialists who start out with a preconceived theory which may have originated in some coincidence, he collected a very large and plausible amount of data from various sources and from his own experience, which, viewed superficially, certainly gave a great deal of color to his statements. He succeeded in having the matter discussed a great deal by his fellow-gynecologists in the various societies of New York, and we in the asylums, had we accepted the statements made, would have expected our vocations to dwindle and fade away, as far as the women were concerned; but it only lasted a few months, like many other fads, such as the eye-strain cure for insanity and epilepsy, and we heard no more of it. I have noticed that it is generally in diseases a thorough knowledge of which can only be obtained by people who devote years, perhaps all their lives, to them, that these specific means of treatment are developed, and they are usually brought forward by men in other lines of practice. That is the case in epilepsy especially, and in insanity. Those oculists who believed they were really curing cases of epilepsy had not studied epilepsy thoroughly enough to understand the disease; they had only studied one manifestation of it. They had not gone to the bottom of it; they had not lived with epileptics and studied their cases for years, but from a brief observation, when they had produced, according to the testimony of relatives, some variation in the symptoms with a temporary cessation in the manifestations, they felt justified in claiming that they had discovered something new. But I do not think those of us who have spent years in close relationship to epileptics could be blamed for feeling sceptical, and, judging from the results, we had a right to be sceptical. But the cure of epilepsy by operating upon the eyes has pretty much subsided. So it was with cases where the uterus and appendages were operated upon for the cure of insanity. The gentlemen who operated were not

[1] See original paper, p. 491.

practical alienists, that is, they had not spent enough time at it; they had not gone to the bottom of the subject, so as to appreciate intelligently the actual value of the influence they produced upon the disease, and they drew their inferences, perhaps candidly, but hastily, and the results were not warranted by subsequent observation.

In regard to operating upon the uterus and appendages for hysteria, I was very much interested in some of the cases cited by the essayist, and I recall a very interesting case which I have had in the clinic for the last two years. It is the case of a young woman of about 23, married, who has had idiopathic epilepsy—I could get no family history—for the last five years. The attacks were not very frequent, not oftener than once a month, and sometimes she would go two or three months. The epilepsy was followed by a high degree of hysteria. She would have a genuine attack of epilepsy, with tongue-biting; sometimes she would pass urine during the spasm; and before she would recover from the epileptic seizure she would pass into a hysteria with contractures, screaming, and the various peculiar stages of unconsciousness would occur, lasting for several hours. She came to Chicago for the purpose of having her ovaries removed. She had been in the main a healthy woman. I do not know the full extent of the operation, whether the tubes were entirely removed or not, but I do know that she has menstruated regularly since, just slightly for a day or two. I suppose our gynecologists would say that part of the tubes had been left. In connection with Dr. Church's case I would say that this woman told me that, although she had one child soon after her marriage, she had never known what sexual enjoyment or desire was until after this operation, when her desires became uncontrollable. The epileptic seizures stopped for several months after the operation, then returned, and with them the most intense sexual desires, so that she would solicit her male acquaintances. This was entirely foreign to her nature, and in her calmer moments she recognized it as being entirely wrong. This strikes me as being an interesting complementary case to that of Dr. Church. She has gone on from bad to worse, until her husband could not tolerate it any longer and has left her. The epilepsy with the hysterical manifestations following continue about the same as before.

Dr. Franklin H. Martin.—As a member of this Society I wish to thank these eminent specialists for meeting with us this evening. I object, rather, to Dr. Church's text, the reported cases of Dr. Rohé. Any man who reports eighteen cases of ovarectomy with the idea of establishing a line of treatment, or as a means of influencing the medical profession at large to establish or disestablish a theory, should at least have reported these cases with a little more detail and more scientific description. A cystic ovary removed with adhesions does not mean anything;

a convoluted tube does not mean very much; pain in the side with pain at menstruation does not mean very much without a further description of the case from the standpoint of the gynecologist. He did not state the pathological conditions which existed in these cases, but simply made a general statement that might be made by a member of the laity.

I have taken a great deal of pains to inquire subsequently of women, where the appendages have been removed, in reference to sexual desire, and I find that almost invariably it is increased. I do not believe that the ovaries have anything to do with sexual desire. I think neurologists will agree that the point of departure is in the nervous system, in the spine, or somewhere outside of these organs. At first I thought that it might be because the women upon whom I operated had been sick and naturally would not be very amorous, but when restored to health the natural condition of affairs returned. But I have been led to believe from a large number of inquiries that sexual desire is increased. Therefore removal of the ovaries could not affect nymphomania.

In regard to operating upon epileptics and insane patients, whenever an insane patient is brought to a gynecologist for operation he should insist upon a consultation with a nerve specialist. The gynecologist should consider whether there is disease in the pelvis; the neurologist should consider the disease from his standpoint. Our methods are now, fortunately, so advanced that an almost perfect diagnosis can be made. If there be a large cystic ovary, a tumor, a pyosalpinx with inflammatory adhesions and peritonitis, operate for the pathological indications found, even if the woman is insane or has epilepsy. If there is no disease of the pelvic organs we should then depend upon the neurologist to settle the question of operation. I have operated upon a case of epilepsy associated with ovarian trouble where there was pelvic reason enough for operating, but the results were negative so far as the epilepsy was concerned. Invariably after operation, after a woman has screwed her courage up to the point, consulted with her friends, selected a physician, and gone through with the ordeal, she is necessarily in a very low state of nervous tone and in a condition to become hypochondriacal; she is in a weakened state physically and mentally, and in a condition where insanity or melancholia might develop. I do not believe, however, that the removal of the appendages or the uterus has any direct influence in producing insanity, and I have never seen either develop, in my experience, subsequent to an operation.

Dr. H. P. Newman.—I must concur in the general expression of opinion in regard to the cases reported by Dr. Church, that they were not well-selected cases and can be adversely criticised from various standpoints. How long subsequent to the operation were these cases reported?

DR. CHURCH.—I think all the operations were done during the last three years.

DR. NEWMAN.—That admission would seem to be the strongest ground for criticism; it is now so well established that simple neurosis or pelvic pain, however severe, is not an indication for removal of the appendages. There must be actual pathological conditions, and these must be determined prior to the operation of removal. Even Battey himself, the originator of the operation, has criticised very severely many of those who have since done the operation for insufficient causes. In regard to the general subject, not all gynecological cases are diseases of the tubes and ovaries. There are others which I would have been very glad to have had Dr. Church take up. He certainly dealt in a very thorough manner with those he did consider, but the relation which some gynecological diseases bear to nervous and mental disorders in general, and *vice versa*, is of great importance. Many kinds of pelvic trouble undoubtedly predispose to, if they do not directly produce, nervous and mental diseases, not only by direct and reflex irritation, but by interference with the nutrition and constitutional health of the patient.

DR. F. BYRON ROBINSON.—The cases reported by Dr. Church, as regards a test, it seems to me are about as bad a number of cases as could be selected; the pathological conditions are not at all what we could attach ourselves to to find out the conditions. There is simply this about women, insane or not: if there is no pathological condition of the pelvic organs, laparatomy is unjustifiable; that is the general rule. As far as I can see, the gynecologist mistakes a central disease for a peripheral disease—I have seen that done many times. He is not familiar with the cerebro-spinal axis and the sympathetic system. A couple of months ago I saw a case where a reputable neurologist had treated a woman for a year for irritable spine, and she had a pyosalpinx. I have seen epileptics operated upon many times as a supposed way of curing them. This seems to me nonsense; I never saw an epileptic cured by taking out the ovaries and tubes. Neurosis from genital irritation is not epilepsy. One thing gynecologists must learn is that the sexual system is not located in the generative organs; it is in the cerebrum. A steer that has been castrated for ten years will run after a cow with the same vigor as a bull; the genitals are mere organs of gratification.

Dr. Church mentioned tortuous tubes as not being pathological; I cannot agree with that. In the embryo the tubes are tortuous, then at puberty they straighten out. They become tortuous in two ways: either they revert to the fetal condition, or the woman has a child and subinvolution of the longitudinal muscles of the tubes makes them contract.

DR. ARCHIBALD CHURCH, in closing the discussion, said: I am very much gratified with the discussion that has been elicited.

It shows very conclusively that there is considerable ground upon which we are agreed. It was insisted early in my remarks that operation was justified in neuroses and mental diseases if the pathological condition in the organs would in itself indicate it on surgical grounds. It was attempted to confine the discussion to those cases in which the operation upon practically normal tubes and ovaries was to be done for the supposed relief of neuroses. In many of the cases reported by Dr. Rohé, to which I called your attention, a normal condition was practically present, and the results obtained were of very insignificant value to the patient, according to his own statement and the record he published in a recent issue of THE AMERICAN JOURNAL OF OBSTETRICS.

In regard to nymphomania, I may be pardoned for calling attention to the fact that some of the gentlemen seem to have the idea that nymphomania consists simply in a heightened sexual desire. It cannot, I think, be called nymphomania unless associated with mental disturbance resulting in loss of self-control and morbid impulses. There may, of course, be hallucinations and delusions.

Regarding convoluted tubes, I do not think that Dr. Robinson can guarantee that every woman at the age of puberty is bound to straighten out her oviducts. There is no reason why a congenital or embryological condition may not persist in the tube as well as in other portions of the body. It should be insisted that operation as a therapeutic measure in neuroses should not be undertaken except as a last resort, and then only when the manifestations of the neurosis are so closely associated with the pelvic viscera and their functions that there could be no question of their interrelation. For my own guidance I have erected the rule that operation upon normal organs for the relief of neuroses is not justifiable, but that, as an exception to that rule, it might be taken into consideration as a last resort when the intimacy of the manifestations of the disease with the functional disability of the sexual apparatus was so close that it may be hoped, by the stopping of menstruation, that the neurosis might be wiped out, having lost its inciting factor.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF CINCINNATI.

Meeting of April 20th, 1893.

The President, WM. H. TAYLOR, M.D., *in the Chair.*

DR. BYRON STANTON reported

A CASE OF INDUCTION OF LABOR BY THE INTRA-UTERINE INJECTION OF GLYCERIN.

The subject of my report is Mrs. T., age 29, height four feet

eleven inches; has a pelvis contracted at the superior and inferior straits, the conjugata vera measuring three inches, the outlet contracted to a less degree. She has borne seven children, the first four still-born; the fifth and sixth were born alive by spontaneous labor a little before the end of the seventh month. The seventh child was born at about eight months by induced labor.

From the patient I get the following in regard to the first three labors: The first child was born by turning, May 19th, 1887, at about the end of the seventh month, a shoulder presenting. The second labor was May 28th, 1888, also a shoulder presentation. The third, August 6th, 1889, at term, the breech presenting; the child was alive when the body was delivered, but died before the delivery of the head could be effected. The fourth child, the first that came under my care, was delivered July 25th, 1890, when the mother was at about the end of the seventh month, the left shoulder presenting, the left hand and a portion of the cord, which was pulseless, protruding from the vagina when I first saw her, which was after she had been in labor eighteen hours. The fifth delivery was April 24th, 1891, at about six and a half months' gestation, the right shoulder presenting; and, by version, a living child was delivered, but it died in a few hours. The sixth delivery was February 6th, 1892, also a right-shoulder presentation, the child being born alive by version at a little less than seven months, but it died the next day. The seventh was born March 31st, 1893, at the end of the thirty-sixth week of pregnancy, by the induction of labor by the intra-uterine injection of glycerin.

Mrs. T.'s last menstruation ended July 22d, 1892. For the first five months she suffered more from nausea than in any preceding pregnancy. About the 10th of December she first felt fetal movements. On the 10th of February she had some uterine pain. This was about the period of pregnancy at which she usually miscarried, but the use of morphia arrested the pains and she seemed like going to full time. Owing to the amount of pelvic contraction the delivery alive of a full-sized child at term was an impossibility. In my opinion this was just such a case as would call for the operation of symphysiotomy, and it was my intention to perform that operation if I could get the consent of the patient and her husband. For a time the patient seemed willing to undergo any operation for the sake of having a living child, but at the end of the eighth month she and her husband positively refused to consent to the operation, and no recourse was left but the induction of labor, which was done on the 31st of March by the injection of sterilized glycerin—a method that has given very satisfactory results in the hands of Pelzer, not only in initiating uterine contractions, but also in increasing them during labor when uterine atony exists.

In my patient the injection was made at 9:45 A.M., about six drachms of glycerin being thrown in by means of a uterine syringe

and a braided linen catheter (No. 13 American scale), the point of which was introduced nine inches into the uterus along the posterior wall.

At 1.45 P.M. labor began, pains being strong from the first, and at 3 o'clock the os was fully dilated, and, as the fetus presented transversely, the patient was placed in position for version and the administration of an anesthetic commenced, when the membranes ruptured spontaneously, a large amount of liquor amnii being expelled. As the left shoulder engaged in the dorso-anterior position, the hand was introduced far enough to grasp the left foot, which was brought down, counter-pressure being made by the left hand upon the head through the abdominal walls. It was an easy matter to turn and deliver the body and arms, but the head engaged in the superior strait with difficulty. Pressure was made with the hand externally applied to give the head proper direction and cause its descent into the pelvis, where it lodged until delivery was completed by the application of forceps, the instrument being required because of the contraction at the inferior strait. The child was asphyxiated and was with some difficulty resuscitated. Twelve hours after birth it had a convulsion, and six hours later another, in which it died. The child weighed five and a quarter pounds; its length was nineteen inches; the biparietal diameter, three and one-eighth inches; circumference of the head, eleven and seven-eighths inches. The mother had retention of urine the second and third days following delivery, probably due to the hard labor, but at no time was a temperature above 101° recorded.

Several new methods of inducing labor have been introduced in the last few years that are more certain and satisfactory than the older methods. This case is reported as illustrative of the method of Pelzer. So far as its safety is concerned, it has no advantage over the bougie of Krause. The introduction of the catheter, with which the glycerin is to be carried well up into the uterus, is as likely to rupture the membranes as the introduction of the bougie; but this is an accident not likely to happen in either method if care is observed to have the os slightly dilated, or at least soft and dilatable. The fixation of the cervix by means of a tenaculum forceps makes the introduction of the catheter or bougie easier and safer, but in my case the position of the os and its softness rendered this unnecessary. But this method has a great advantage over that of Krause, in that it much more promptly excites uterine action. Some writers have advised the rejection of Krause's method because the labor which it determines progresses too slowly. Pajot[1] reports a case showing the difficulty of inducing labor by the bougie, delivery not taking place until eight and a half days after the first efforts to excite action, and then only by supplementing the bougies by sponge tents, vaginal douches, and rubber dila-

[1] Annales de Gyn., 1890.

tors; but in his case all of the efforts were expended upon the lower part of the uterus, not one of the bougies entering the organ more than four inches. To be effective the bougie should be introduced into the uterus eight or ten inches—the higher the better—excitation of uterine contractions being much more prompt when the irritation is applied to the body of the uterus.

With the method of Champetier de Ribes I have had no experience, but the liability to cause separation of the placenta and to change a head into a shoulder presentation are arguments against that method.

The method of Pelzer is one easy of execution, is a very efficient one, and is safe if properly performed. The operation should be done under the strictest antiseptic precautions. The instruments used must be thoroughly sterilized. As in all other methods, the vagina and vulva must be carefully disinfected. The glycerin must be chemically pure and sterilized by boiling, and kept in a vial that has been thoroughly cleansed and boiled, the cork with which it is stopped being also boiled. An important point is to see that no air is introduced into the uterus. To prevent this accident the syringe and catheter should be filled with glycerin before introduction. The amount of glycerin used by Pelzer was from one to four ounces, but a smaller quantity has acted very promptly. Dr. J. Clifton Edgar, of New York, reports two cases in which one-half ounce was used; in one case labor beginning in two and a half hours, in the other beginning in half an hour, but a second injection was given about four hours later to accelerate labor.

It has been recommended to put the patient on her side in the Sims position or in the knee-chest position, or to elevate the hips, but if the injection is carried well up into the uterus there is not much danger of it escaping when the catheter is withdrawn.

Dr. Palmer.—I have never used intra-uterine injections of glycerin or anything else for this purpose. I have obtained so much satisfaction from the Krause method of the introduction of the gum-elastic bougie for the induction of labor, that I have had no doubt as to its great usefulness. In fact, I think that this method is so excellent that I have had no occasion to look for anything else. I have never known the intra-uterine bougie to do any harm. I have never had sepsis following. I have never used a catheter, but the antiseptic bougie. In every case labor has come on naturally by uterine contraction, dilatation, and finally a rupture of the membranes, in about twelve hours, and in all cases labor has been completed within thirty-six hours. But I can conceive that the intra-uterine injection of glycerin may be applicable sometimes. I might be called upon to use it if the bougie should fail. On one occasion I found it needful to use the bougie the second time, and I then introduced a larger one on the other side of the uterus. I can

conceive of some advantages this method of glycerin injections may have—as when we need to induce labor very speedily. I believe this method brings on the labor more speedily than the bougie does. So far as experience with it goes, labor has been induced sometimes in twenty minutes, and generally within an hour. My experience with the bougie is that frequently labor does not come on for five or six hours. If it is necessary to induce labor speedily and the bougie should fail, then I should say to use the sterilized glycerin. This might be necessary in placenta previa.

Dr. Wenning.—Although this is the latest method of inducing labor, yet I think it is really a very old one so far as injecting fluid for the purpose of producing uterine contractions; but I do not see any advantages in this method over the injection of other fluids—as of water, for instance. Of course, if we succeed in inducing labor more readily than by any other method, that would be an advantage. In the paper read this evening the frequency of transverse positions impressed me. It shows there was a want of adaptability of the head to the pelvis, and probably would offer a very important point in diagnosing something wrong about the pelvis. The conjugate of the pelvis was about three inches in this case. I have had no practical experience with either of these methods, but I cannot understand the object of the last speaker in introducing a larger bougie afterward, for we only introduce the bougie for the purpose of inducing contractions, and a small one would act as well as a large one. It is simply used to prompt uterine contractions, and not to separate the membranes.

Dr. Rufus B. Hall.—It occurs to me that this new method of intra-uterine injections of glycerin would be a very desirable one in some cases—for instance, where labor would need to be induced rapidly. I differ with the last two speakers in the fact that glycerin would act somewhat differently from water or any other fluid. It is a well-recognized fact that glycerin, when injected into the rectum, adds its own volume by the accumulation of fluids, and I do not see why it would not do the same thing when it is injected inside the uterus—and I believe it does do so—and thereby induce a more rapid labor. I do not know how soon after the injection of an ounce of water into the uterus labor would be induced, compared with the injection of glycerin in the same case, but I do know that in rectal cases you can inject one, two, or three ounces of water and the patient will not reject it, while an ounce of glycerin is soon expelled, with perhaps several ounces of fluid additional; and this clinical fact brings up the question as to whether water would induce labor as readily as glycerin. I do not believe it would do so. The agent which extracts water from any tissue acts as an irritant, and we all know the power of glycerin to extract water from the tissues. I do not believe the quantity of glycerin

likely to be absorbed would have any detrimental effect upon the mother. I can recall three cases in which I induced labor by the introduction of a bougie, and the labors were prompt, commencing in about twelve hours, and all being completed inside of thirty-six hours and without an accident to any of them. I have not tried this method, as I am not now doing obstetrical work; but it occurs to me that this method adds a very valuable adjunct to our previous methods of inducing labor, and one which I think would be just as harmless, if not less so, as a bougie.

Dr. C. A. L. Reed.—I would like to emphasize the importance of using glycerin, for other fluids will not answer the purpose as well, if at all. Something more is required than a mere separation of the sac from the uterine wall, and there is no fluid with which I am acquainted that is an absolutely unirritating fluid, and that will bring a response from the peripheral nerve filaments with which it comes in contact, as will glycerin. Glycerin has not obtained the dignity it should occupy in obstetrical and gynecological experiments. Its true position has not yet been so well defined in obstetrical practice. Of course the essential feature of glycerin is its exosmotic property, or its ability to extract water from the tissues with which it comes in contact.

Glycerin is not absorbed, although it might be taken into the circulation by some venous sinus. This is an important fact. Not being absorbed, but giving rise to an outward flow, it carries out septic particles. So thoroughly do I accept this theory and act upon it that I do not pack a uterus, after curetting it, without saturating the parts with glycerin. I was recently called to curette a case following a miscarriage, in which there had obviously been some retained placenta which gave rise to an offensive discharge. In that case, which was one of only about three months' gestation, I found quite a tight contraction, with a part of the placental tissue incarcerated above. By a gentle but forcible dilatation I was able to dilate the uterus and flush the cavity, and I then packed it with gauze saturated with glycerin. After this I felt comparatively safe: first, because I had an antiseptic with reliable strength, and also because I had established the exosmotic flow. When the principle of exosmosis, as well as the ability of glycerin to establish it, is recognized, that agent will assume a much more important place in gynecological and obstetrical practice.

Dr. Jones.—I had a patient a few years ago who attempted miscarriage. She took an ordinary syringe with a small pipe, and with this injected a lot of strong soapsuds into the uterus. The pains did not begin until about an hour afterward, and then within four hours she was delivered.

Dr. Stanton, closing the discussion, said: The explanation given by Drs. Reed and Hall will account for the greater effi-

ciency of glycerin, its affinity for water causing the abstraction of serum from the blood vessels of the uterus, thus increasing the amount of fluid between the membranes and the uterine walls. The induction of labor by the intra-uterine injection of fluids is not new. The injection of water, known as Cohen's method, was first recommended over fifty years ago, but its action was mostly slow. In one of Dr. Edgar's cases where glycerin was used labor began in half an hour. Whatever fluid is used, it should be about the temperature of the body. In regard to the use of a bougie (Krause's method), I would say that I have found it successful, but slower in exciting uterine contractions than the intra-uterine injections of glycerin. In one of my cases forty-eight hours elapsed before labor began, and then a second bougie was introduced, the first having been deflected from its course and not reaching high up into the uterus.

Dr. G. Zinke presented

A CASE OF SUPPURATIVE METROSALPINGITIS.

About a month ago (March 17th) a case was referred to me by Dr. Stewart, which he declined for the reason that he had a case of labor in progress, being apprehensive that he might be the medium of contagion. The patient was a woman 32 years of age, two children living and several induced miscarriages. She had herself committed an abortion upon a four months' fetus two weeks prior to my first visit. Dr. Stewart, who saw the patient only a few hours before, found her with a temperature of 105° and pulse 130. Two hours later the temperature had increased to 106° and the pulse to 150. The abdomen was distended, tender to the touch, and tympanitic. The discharge from the vagina was so offensive that the whole room in which she lay was permeated by it. The midwife who had delivered the fetus two weeks previously stated that there was then and ever since an odor of decomposition. The patient stoutly denied having meddled with herself, but husband and friends admitted her indiscretion. On examination I found the os gaping, readily admitting my finger, and the uterus presented an open and distended cavity, the interior of which appeared to me to correspond to a picture which we find in Thomas and Mundé's book, representing the uterine cavity after partial removal of a large, sessile fibroid. The removal of my finger was followed by a sanguineous, highly offensive discharge. Diagnosis, septicemia. Prognosis, unfavorable. Treatment suggested to her husband and friends was curettement, with the remark that she would in all probability die notwithstanding. But there was a slender thread of hope in this operation, for, if let alone, death necessarily was but a question of a few hours. Consent was readily given. The temperature, before I was ready to proceed, had risen to 107° and the pulse to 180. I was assisted by Drs. Fauth

and Cook. After administering a hypodermic injection of morphine (one-sixth of a grain), she was anesthetized with the A. C. E. mixture. The patient having been placed upon the table in the lithotomy position, the perineum retracted and the os fully exposed, I introduced a sharp curette irrigator. The curette entered the uterine cavity easily to the depth of perhaps two inches. No force except gentle pressure was employed while I curetted and irrigated, when suddenly the curette passed its full length into what I believed to be the peritoneal cavity, because I could plainly feel its distal extremity a little to the right above the symphysis pubis. This unexpected accident was followed immediately by the escape of at least a quart of pus of the most disagreeable odor. After the pus ceased to flow, the cavity before me (for I am not willing even now to say what it was) was thoroughly irrigated with a one-per-cent creolin solution, and then packed with three strips of iodoform gauze, each one yard in length, when the patient was placed in bed. The following morning the temperature was 100° and pulse 120. I removed the gauze, irrigated the cavity with creolin solution, and again packed it with iodoform gauze. The same evening the temperature had fallen to 99° and pulse 100. The irrigations with one-per-cent solution of creolin and packings with iodoform gauze were continued each day, using less gauze each time, for a period of nearly two weeks, when the cavity had contracted to the size, shape, and character of a uterine cavity. Her recovery was not only prompt, but a surprise to all. The twelfth day after my first visit she left her bed, and on the sixteenth she walked into my office. I have not seen her for two weeks. She paid her bill, and I suppose she is perfectly well.

Dr. Johnstone.—This is one of two things—*i.e.*, either a perforation of the uterine wall or a case similar to one I had the other day. Over in the left angle of the uterus, where I usually begin the operation, the curette suddenly slipped an inch and a half or two inches further in. I felt I had punctured the uterus. I very cautiously continued around the uterus and returned to the same spot, when the same thing again occurred. In scraping with the curette your stroke is always downward, but this occurred on the up-stroke, and on examination I found that one horn of the uterus was more developed than the other. I think this condition may have existed in the case reported this evening, and that the curette simply slipped into a double or bifurcated uterus which had been temporarily blocked. Sometimes the human uterus resembles that of a bitch, and sometimes this condition will be found on one side only. So I think the reporter has not necessarily punctured the uterus, unless he is sure that he has from the thinness of the abdominal wall in front of his curette.

Dr. Palmer.—Doubtless everybody present has a solution

for this difficulty. I do not think Dr. Zinke's curette perforated the uterine wall. I think his curette had likely gone into the opening of the Fallopian tube on one side. That opening must certainly have been unduly patulous, for some pus was discharged before and the curette simply made the opening larger. In corroboration of this theory I have but this to mention: Some seven or eight years ago, when attending the dispensary of the Ohio Medical College, I was sounding the uterus of a patient with an ordinary sound. My instrument was passed slowly, gradually, and carefully; it went in the usual length of the uterus, and then, without any pressure at all, it went on and on, and I thought it would never stop. It went in until the handle was at the os externum. I thought I could feel the end of the sound through the abdominal wall. The patient got up, and I asked her if she had any pain. She replied that she had none, and I then requested her to sit down in the waiting room awhile. She did so and had no pain, and I directed her to go home, but to send for me if she had any trouble. But in a few days she returned with the statement that she had had no pain. I think it is very probable that in this case the curette went into the Fallopian tube.

Dr. Edwin Ricketts.—If this was a pyosalpinx it certainly was very large, since it contained so much pus. That of itself, I am sure, is enough to show it was not a pyosalpinx. Since we can have a pelvic abscess without disease of the appendages, I am inclined to think this a pelvic abscess without involvement of one or both tubes, especially as this trouble came on following an abortion. Certainly there must have been a healthy ovary, or pregnancy would not have existed in such a short time from this enormous discharge of pus. It is very easy to explain how a probe could pass into the abscess, and possibly through the uterine wall, to the extent described by the operator.

Dr. C. A. L. Reed.—I was impressed with the idea that this is another case of what is recognized as the true pathology of post-puerperal abscess. An induced abortion is likely to be attended with some intracervical traumatism, and infection received at that time finds lodgment at the seat of this trauma and reaches the open mouths of the lymphatics which extend throughout the cellular tissue to either side of the uterus. The suppuration extends along either side until it breaks down the cellular tissue and invades contiguous structures. A pus cavity of this sort situated in the right, and containing a quart of pus, should naturally push the uterus to the left in the form of a lateral version. The curette passing into the uterus, necessarily enlarged, would come in contact with the right wall of that organ, perhaps at the very site of trauma, maybe at the very point where suppuration was pushing most on the uterine tissue, and I can readily understand how a very judicious curetting might perforate the pus cavity in this way. I have seen

these cavities in precisely the form which would account for the second gush of pus, where the broad ligament would be obliterated, splitting the pelvic diaphragm and extending clear around to the other side. These secondary pockets would give rise to the second burst of pus, and this seems to me the most reasonable explanation of the case. The case is exceedingly important, for it shows the extent to which injury can be done to the uterus without serious damage to the patient. It recalls a case recently related to me. A physician made the usual median incision, and found a cavity of this kind with involved appendages plastered down and adherent but not containing pus. After reaching the abdomen from the inside of the cavity, he endeavored to evacuate it from above and enucleate the appendages, but in the act of enucleation he found himself confronted by hemorrhage, the landmarks completely obliterated, and a mass of tissue becoming loose. On examining the tissue in his hands he discovered it was the corpus uteri. With a state of tissues which would not permit a ligature, and a hemorrhage controlled by clamps on the inside, he simply flushed out the cavity, packed the pelvic cavity with gauze, and put the patient to bed without an abdominal suture. She recovered! This shows how the uterus may become softened, and also how great injury may be done to this organ and yet the patient recover.

DIFFICULT REMOVAL OF A PLACENTA WHICH HAD FORMED AN ORGANIC UNION WITH THE UTERUS.

Dr. Johnstone.—About eleven months ago a lady came to me with a chronic metritis of at least five years' standing. She did not become pregnant until last November. Six weeks afterward she thought she had aborted, which proved to be not the case, although there was a very decided and heavy flow of blood. She went on to the fifth month, when she miscarried. The physicians could not remove the placenta, and I was called. I found it fixed absolutely firm, and in fact never found more difficulty in peeling away an old pyosalpinx than I had in removing this. The child had been delivered some twenty-four or twenty-six hours before I saw the case, and the placenta was united by a true organic union with the uterus. Since I removed the placenta the patient has made an uninterrupted recovery. The point I want to bring out is, how much did this hemorrhage at six weeks have to do with the placentitis which lasted throughout the rest of the pregnancy and was undoubtedly the cause of the miscarriage? Was the blood clot which formed between the chorion and decidua organized into connective tissue? And was this the cause, not only of the ultimate starving out of the child, but also the fixation of the placenta to the uterine wall?

Dr. Wenning.—It is my firm conviction that as long as the placenta is intact after an abortion there is very little danger,

but the moment a portion is torn away you have the danger of hemorrhage. After the embryo comes away, if the placenta remains and the uterus contracts, as it should do, I do not think there is much danger in waiting; but the moment you attempt to remove the placenta, then is there danger of hemorrhage. All cases of post-partum hemorrhage which I have seen have been due to the remaining of a *portion* of the placenta. I do not think it is safe or best to deliver the placenta when it is intact. However, if you cannot stay with your case it may be better to remove it.

Dr. E. W. Mitchell.—In the removal of the placenta it is important to consider the period of gestation. When the woman has been pregnant four, five, or six months the placenta is much more developed than at two or three months and there is more danger of hemorrhage. Also, if a fetus has been expelled at the end of five or six months, of course the cervix is much dilated and we can reach it better. My practice has been to be guided by the condition of the patient, the period of pregnancy, and the fact whether all or only a part of the placenta remains. I think the last speaker is correct as to thorough removal of all, if any of the placenta is removed. Where the cervix had not been well dilated, and when I was within easy call of the patient, I have often thought it better to wait for the placenta to be loosened, at least, if not expelled, and the cervix somewhat dilated by natural process. I have not yet had occasion to regret this delay.

Meeting of May 18th, 1893.

The President, Wm. H. Taylor, M.D., *in the Chair*.

Dr. G. S. Mitchell reported

THE SECOND SUCCESSFUL CESAREAN SECTION PERFORMED IN CINCINNATI.[1]

Dr. C. A. L. Reed.—While it is true that the sutures were passed in the wound, which is somewhat a modification of a more or less recognized principle, the suture here was made a continuous one, much to the economy of time and, I think, of efficiency. But that did not impress me as being the leading feature of this case. There were several important points. In the first place, this case came under the observation of Dr. Mitchell at the inception of labor. It followed, therefore, that this case was not subject to bruising and traumata from an attempt to deliver by the forceps. Indeed, the condition presented barred the use of the forceps on the start, and hence the doctor, unlike my friend Dr. Zinke in his first Cesarean section,

[1] See original paper, p. 520.

had to deal with a patient in whom the uterus was not bruised. In the next place, the interesting fact that conduced to her recovery was that the after-treatment was limited to those things absolutely necessary. There was no super-condition. The patient was not subjected to a nephrectomy, an ovariotomy, a myomectomy, or anything but a simple Cesarean section. The next feature, which perhaps should really come before the last one, was that the operation was begun in time. It was a comparatively early operation, but not too early. Sufficient time had elapsed to secure dilatation of the cervix and drainage, but it was sufficiently early to be done before she had exhausted her strength. An important feature of the operation, and one that facilitated matters very considerably, was one that is not new in this particular instance, and that is the use of elastic pressure as a preliminary hemostatic. It was very interesting to observe, however, on loosening the elastic ligature at the base of the uterus, that there was no gush of hemorrhage from the interior. Contraction was so prompt and firm that hemostasis had become established. The exposed parts were carefully washed, flushed, and the incision was closed. The tumor was a hard mass occupying the cul-de-sac, and it is there yet.

I believe that Cesarean section was strictly the proper procedure under the circumstances, and as performed here I believe it is the easiest operation for delivery of the infant by section. It is an easier operation than the Porro, although the Porro is not a difficult operation. Now, I may be charged with inconsistency, for I have advised the Porro operation over all others on the floor of this Society, and I may state that I am satisfied the Porro operation is generally the one to be adopted, except in cases such as this one. It should be used to prevent a return of the complication. But in this instance we had another state of affairs to deal with. There is manifest indication of a second abdominal section in this case, which perhaps should lead to the ablation of both ovaries, but I do not think there is anything to interfere with the delivery of a child. There were, therefore, two reasons why this operation rather than the Porro should have been done in this case—viz.: (*a*) the presence of a solid tumor, which gave rise to the necessity for a second abdominal section, and (*b*) a fair prospect of conception by the remaining side and delivery *viâ naturali*.

A CASE OF CESAREAN SECTION.

Dr. Sigmar Stark.—I would like to refer to a case of Cesarean section I met with last September. The patient was a German woman, about 42 years of age, who had given birth to two children, the last one about fifteen years ago. Five years ago she remarried, and two years later conceived. She was delivered, by means of the forceps, of a mutilated child. She then conceived again, and I was called in to see her at the time

of her last labor. Labor set in about 8 P.M. December 2d, and she summoned a midwife. The midwife remained with her all night, but no progress took place, and about 8 o'clock in the morning Dr. Krouse was sent for. He found the os dilated and above the brim of the pelvis, as was also the child. I was then telephoned for, and on my arrival I found the membranes presenting at the vulva, forming a large bag of waters. During my first examination a contraction set in, the membranes were ruptured, and at once there was a prolapsus of the cord. I then discovered that there was an obstruction at the brim of the pelvis in the nature of an osseous tumor springing from the sacrum. It was a globular tumor and almost completely obstructed the brim. There was only sufficient space for the introduction of two fingers and then slight separation. In stating my opinion of the case to the family, I told them I did not think the woman could be delivered of even a mutilated child, and that symphysiotomy was out of the question, and suggested Cesarean section, to which they at first strongly objected, but to which they finally gave their consent. I advised taking her to the hospital, but this they would not consent to. They were a poor family, occupying but two rooms, and the hygienic surroundings were anything but desirable. I then sent for Dr. Zinke and Dr. Jos. Marcus, and the operation was performed.

The incision into the uterus was made without eventration of the organ. There was hardly any hemorrhage at the time, and no necessity for applying a rubber band about the neck of the uterus. The placenta and child were easily extracted. Labor had existed so long that we thought we would find a very thin uterine wall, but it was quite thick. Subsequently I sewed up the uterus with a continuous silk suture, and then its peritoneal covering was sewed with a Lembert suture, and the abdominal cavity was closed by means of the interrupted silk suture. Prior to the operation her temperature was 101° and the pulse rapid. In the evening of the day of the operation her temperature had gone down to normal, although the pulse was rather rapid, and on the following day the temperature remained normal and the pulse decreased in frequency. On the third day, however, there was a rising temperature. Immediately after the operation there was marked tympanites, which worried Dr. Krouse and myself for a number of days, until she finally told us she paid no attention to the size of her abdomen, for it was always that way. It therefore appeared that I had been worrying about the distention of her intestines without cause. The temperature remained high on the third and fourth days, and on the fifth day we secured a very copious movement of the bowels—although attempts had been made to secure this before—and the temperature then became normal and the pulse 104. She was in a good condition on the fifth and sixth days, and on the eighth day she sat up in bed and held herself. I

saw her at 4 o'clock on the evening of the eighth day, and the temperature then was 99.4°. I was invited out to dinner that evening, and while at the table received a telephone message stating she had suddenly gone into a collapse, and the following day she died. Her temperature that evening went down to 97°, and the next morning it was 96°. The child did nicely.

A few points as to Cesarean section in general. It seems to me, as the essayist of the evening has stated, that the suture of the uterus is superfluous, for the contraction of the uterus itself is so thorough and complete that the edges of the uterine wound are approximated, and there is no need of taking up the time or increasing the possibilities of infecting the peritoneum by introducing a suture. I say the possibilities of infecting the peritoneum, for the reason that you establish a drainage toward the peritoneum by means of the suture, and it certainly is best not introduced. The peritoneal suture should be introduced because it closes off the uterine wound from the peritoneal cavity. The question of puncturing the membranes prior to the removal of the child is also one that ought to be considered. I think it is a good plan, and it would be wise to puncture them per vaginam prior to the uterine incision, and let the water pass off in this way, for by this means you would do away with needless possible contamination of the peritoneal cavity. The best position for the patient to occupy during Cesarean section is one of interest. At present most abdominal surgeons perform laparatomy with the patient in the Trendelenburg posture, but to my knowledge this position has not been adopted in the operation of Cesarean section; and I think in this operation in particular it is a good position to assume, for the reason that you so conveniently expose the uterus, and the blood from the wound does not enter the abdominal cavity, but gravitates out of your way and allows you more readily to finish the operation.

Dr. Gustav Zinke.—Dr. Mitchell is certainly to be congratulated, and we can only express regret at the loss of Dr. Stark's patient, for which he is in no way to blame. Heretofore recovery after Cesarean section was a mere accident, while now we save the patient by strictly scientific principles; if the patient presents herself at an early date, if the operator is thoroughly familiar with the technique of the operation and possesses otherwise ordinary skill, and is able to secure asepsis, it is difficult to understand why the patient should not recover. I was much impressed with the ease with which the uterine sutures have been discarded by the essayist of the evening, as well as by the last speaker. Sänger, in formulating the modern Cesarean section, has taken into consideration all the different ways in which the uterine wound has been treated in the past and present. We all know that women have recovered when the uterus was not sutured, as in cases where the uterus has been ripped open by accident. This is amply illustrated by the cases reported by Harris.

I, for my part, seriously apprehend the abandonment of the uterine suture. I think the fear of contaminating the deep sutures, as expressed by the latter speaker, is not well grounded. Look at the results obtained by Leopold, who operates according to the rules laid down by Sänger. I will not deny that the deep sutures may be abandoned, but doubt very seriously whether we are justified in doing so in the light of the present results, which can scarcely be improved. It is a grave question with me whether we should subject our patients to such risk, and, for my part, I would be loath to give up the deep suture and content myself with the peritoneal suture alone.

As to the three cases of Cesarean section which I have seen. The first case was in a tenement house on Buckeye street, in a dark, dirty, dreary room with very low ceiling, only one window, and containing the bed, a cooking stove, wash tubs, indeed everything necessary to "keep house." The out-houses, ventilating shafts, reached up to and were immediately in front of the window, and the hygienic surroundings were indeed bad. The patient had been in labor forty-eight hours, and when first called I found the soft parts already in a gangrenous state. The operation was performed under the most unfavorable conditions; the child was born alive, but the mother died ten days later of sepsis.

The second case was the one reported by Dr. Stark, and in which I had the pleasure to assist.

The third case was under my control for two months previous to the operation; it was successful. In this case the Sänger method was faithfully carried out. The uterus contained eight deep and twelve superficial sutures. But for the presence of incipient phthisis in the individual we probably would not have had a rise in temperature, and also a diarrhea, which, to some extent, menaced the otherwise favorable progress of the case.

In my opinion the indications for the Porro operation have ceased to exist. If, as stated by one of the speakers, it is performed simply and solely to prevent future pregnancies, this can be more readily obtained by tying off the Fallopian tubes, by removal of the ovaries, or both. This certainly does not prolong or increase the risk of the operation. I think the point is well taken in reference to the rupture of the membranes prior to the operation, although in none of the cases which I have attended have we experienced any difficulty with the amniotic fluid. It does not seem to me worth while to place the patient in the Trendelenburg position, for it would cause the amniotic fluid to enter the abdominal cavity. With the patient in the ordinary position there is little or no danger of this accident. If the amniotic fluid is out of the way and the os sufficiently dilated to give ready exit to the lochial discharges, the ordinary recumbent position is the most convenient and safest. The hemorrhage from the uterine wound is not as alarming as one might suppose.

In none of the cases have I seen threatening hemorrhage from the uterine incision, and the amount of bleeding in the case reported by Dr. Stark was very little; indeed, I think he exaggerates when he says half an ounce, for we did not have to do any sponging whatever. The placenta was implanted anteriorly. The incision was carefully made through the uterine structure alone, and as the organ contracted the placenta was crowded into and out of the wound, and expelled without the loss of blood. After the placenta had thus been expelled, the child was delivered with equal promptness and facility by the breech. The operation is formidable in appearance, but if one is fully acquainted with the procedure and operates under favorable circumstances there is little danger of losing the mother or the child.

A SYMPHYSIOTOMY.

Dr. Gustav Zinke.—A week ago last Monday I was summoned to see a patient in the care of Dr. Rooer, who informed me that the case had been in the hands of a midwife since the Saturday preceding. He was called in in the morning, when he found the woman suffering intensely, and upon examination discovered that the membranes had ruptured, that there was a fetid discharge from the vagina, the os partly dilated but very thick, and the head high above the brim. The pains were very weak, and he gave five grains of quinine and one-eighth of a grain of morphia to encourage the pains and lessen the suffering. He telephoned me about 2 o'clock. Upon my arrival I found the conditions as he stated, only that the soft parts were highly edematous, swollen, hot, dry, and livid. I could only with difficulty reach the head, it being still high above the brim, and I found the cervix in a sloughing condition. History: Sixth pregnancy. The first two children were born with aid of instruments at term, but dead; the third and fourth were born prematurely and dead; the fifth, a small child, still living. The mother's pulse was rapid, but good; the temperature at the time was not taken. Measurements of pelvis all normal with exception of the external conjugate, which measured sixteen and a half centimetres. The child living, I determined to perform a symphysiotomy. By 4 o'clock everything was ready, the instruments sterilized, the patient and table washed, hot and cold boiled water ready for irrigation. The vagina was first irrigated with a bichloride solution 1:4000. The abdomen was then washed, scrubbed, and the symphysis pubis, mons veneris, and vulva shaved. I commenced the incision about one inch above the symphysis pubis, and continued it down to the clitoris. I was surprised with what ease I could separate the tissues from the inner surface of the symphysis pubis; I had no difficulty in forcing my finger down to the arch of the pubis. Contrary to the advice given in Harris' paper (to divide the symphysis from below with the Galbiati knife), I divided it from above. The

knife readily went through the cartilage, the pelvis fell apart with a loud cracking noise, separating the joints about two inches at once. I then applied the axis-traction forceps, first to the sides of the pelvis, but was unable to bring the child down; then to the sides of head. The head, occiput to the left, presenting in the transverse diameter, I placed the left blade of the forceps between the left side of the child's head and the promontory, and the right blade between the right side of the child's head and the symphysis. She was safely delivered, and without damage to the perineum. The child was born asphyxiated, but through the efforts of Dr. Evans it revived and is now doing well. This being the eleventh day after the operation, I may say that the patient is perfectly safe. She has had no elevation of temperature for three days, her bowels have acted, appetite good, pulse normal, and the child in excellent condition. Union over the symphysis took place by first intention. After the child was delivered we had to make pressure over the trochanters to bring the symphysis together. Five sutures were introduced. As a precautionary measure, and for fear of contaminating the wound above, I put a strip of iodoform gauze below the symphysis pubis, bringing it out from below at the lower angle of the wound. The gauze, remaining perfectly dry and clean, was removed after forty-eight hours.

ABSTRACT.

VINAY, CH.: SUDDEN DEATH DURING LABOR (*Arch. de Toc. et de Gyn.*, January and February, 1893).—The causes of rapid or sudden death during labor are the following:

1. Embolism of the right heart and pulmonary artery.
2. Entrance of air into the veins.
3. Syncope and shock.
4. Various lesions:
 - *a.* Cardiac lesions and rupture of aneurismal sacs.
 - *b.* Cerebral and meningeal hemorrhages.
 - *c.* Overwhelming hemoptysis and hematemesis.
 - *d.* Pleuritic effusions.
 - *e.* Rupture of hepatic abscess, etc.

I. Embolism of the Pulmonary Artery.—This is the most frequent cause of sudden death during labor. We know that two conditions are essential to the formation of an embolus—coagulation of the blood within some vein, and migration of the thrombus. In the cases under consideration the coagulation occurs in the vicinity of the uterus, usually in the pampiniform plexus or in one of the large veins of the pelvis or thigh. Septicemia plays an important rôle in the production of emboli,

yet perhaps not an exclusive one, since death from this cause sometimes occurs some time after a normal labor, when the patient seems to be almost convalescent. It is especially liable to occur in women rendered anemic by pregnancy or by hemorrhage. Multiparæ are quite as liable to this accident as are primiparæ.

The symptoms rarely appear before the tenth day, the dangerous period extending from the fourteenth to the twenty-fourth day. The sudden obliteration of the pulmonary artery occurs when the patient is convalescent; when she sits up or begins to walk; sometimes during the simple effort of eating, of changing the clothes, of going to stool, or of laughing or extending the hand. Absolutely sudden death is rare. As a rule the struggle lasts for several minutes, the only symptoms being sudden weakness, with pallor of the face, a sensation of suffocation, some froth upon the lips, a few convulsive movements of the face and muscles, and dilatation of the pupils. Sometimes the agony lasts three-quarters of an hour, several hours, even several days, some of the symptoms resembling those of syncope, others those of asphyxia. Occasionally there are premonitory symptoms.

At the autopsy a free coagulum is found either in the right heart or in the pulmonary artery. Paget and Meigs, Playfair and Young, admit the possibility of the formation of spontaneous coagula in these situations in parturient women who suffer from anemia. Vinay, however, believes that the formation of thrombi in the puerperal state is always dependent upon a local lesion, which is rarely found in the vicinity of the heart; phlebitis of the veins of the pelvis is, however, of frequent occurrence in puerperal infection, and therefore the neighborhood of the uterus is probably the habitual source of coagula found in the pulmonary artery. Upon the size of the embolus depends the gravity of the result.

If the formation of coagula were always dependent upon septicemia, strict antisepsis would avert the calamity. As it is, it probably saves many patients. Absolute repose must be enforced upon the manifestation of dyspnea, syncope, or sudden and violent pain in the side. When the attack is at all prolonged, excitants of the peripheric nervous system may be resorted to—cutaneous revulsives, dry cups upon the chest, artificial respiration, subcutaneous injections of ether, caffeine, or camphor dissolved in oil or liquid vaseline. Ewald claims to have resuscitated a patient presenting all the symptoms of embolus of the pulmonary artery by the subcutaneous injection every five minutes of one-third of a grain of camphor until forty grains had been given. With five and a half drachms of liquid vaseline and one drachm of camphor, each Pravaz syringe would contain one-third grain of camphor. Absolute rest of body and mind is essential. The patient should be wrapped in hot cloths

and placed in a darkened and quiet room to which the air is freely admitted.

II. Entrance of Air into the Veins.—When air penetrates into the uterine veins, the necessary conditions are that, first, the air enters the uterus, and, second, the veins are open to receive it. The first condition is caused by repeated examinations, maneuvres for rupturing the membranes, sometimes even by the use of the douche to induce labor, by intra-uterine catheters from which the air has not been exhausted, and chiefly by the introduction of the hand for performing version or artificial delivery, especially in cases of placenta previa. In the majority of cases the air is expelled through the cervix; but should a specially energetic contraction or a coagulum close this orifice, the imprisoned air may be absorbed by the veins. If the introduction of air into the uterus is ever spontaneous—*i.e.*, independent of any of the methods of intervention enumerated—it is certainly extremely rare. Lateral decubitus, the genupectoral position, facilitate the entrance of air into the vagina; simultaneous efforts at inspiration may cause entrance of the air from the vagina into the uterus. Cordwent believes that this accident may be due to relaxation of the uterine muscle following precipitate labor. Winckel publishes the account of a case of sudden death in a parturient woman suffering from cancer of the cervix and vagina. The hydrocephalic fetal head in the rigid cervical canal was subjected to movements of ascent and descent which permitted the entrance of air into the veins of the vicinity. At the autopsy the atmospheric air was traced even in the vessels of the cerebrum.

The uterine veins, by their large calibre, absence of valves, and large openings upon the internal uterine surface, seem to favor the entrance of air. If a small amount only of air be absorbed, there may be merely symptoms of malaise, oppression, and perhaps syncope, followed by recovery. In fatal cases the symptoms are analogous to those of embolism. Death is due to arrest of the heart's action; the right auricle is distended and cannot contract upon the elastic foreign body within it.

At the autopsy the uterine sinuses and the vena cava are found to be filled with air bubbles; the right ventricle and auricle are greatly distended and yield a clear, tympanitic sound upon percussion. When a section is made in water, air unmixed with blood escapes.

Diagnosis is established by the history of the case. Death from air in the veins occurs during or shortly after labor, thus differing from embolus. Treatment should be directed to stimulating cardiac energy and combating rapid asphyxia.

III. Syncope, Shock.—Syncope is always preceded by serious accidents, such as hemorrhage from uterine inertia or abnormally placed placenta, or by excessive labor pains. Cases of ruptured uterus usually terminate in syncope. It may even be

caused by rapid evacuation of the uterus in twin pregnancy, or hydramnios, or after prolonged mechanical intervention. The nervous exhaustion following such traumatism is usually preceded by hemorrhage, and death is a result of shock rather than of syncope. The temperature is lowered, the extremities are cold, the eyes glassy, and the voice extinguished. just as in cases of surgical shock.

Some cases of mild shock result from accidental compression of the ovary in the application of the Credé method of delivery. At the moment of compression of the uterus the patient utters a cry and becomes motionless and insensible, the respiration is short, and the pulse imperceptible. Recovery follows within a few hours.

IV. Varied Lesions.—Under this heading are included causes of death which have only an accidental or remote connection with labor and delivery. The lesions antedate labor, but are made manifest at that time.

(*a*) *Lesions of the heart* deserve the first mention. Vinay believes that valvular lesions, when compensated, are rarely attended with danger during pregnancy and labor. Not so when the myocardium is degenerated and when functional disturbances indicating insufficiency existed before gestation. The mechanical disturbances incident to pregnancy, and the excess of arterial pressure determined by labor, must have an unfavorable influence upon an asthenic heart. Death may occur before or during labor or a few hours after. The extra work endured by the heart during the period of expulsion, the persistence of arterial hypertension, the amount of blood flowing back from the abdomen to the pulmonary circulation, cause extreme anxiety, an agonizing desire for air, which persists after expulsion of the child. This is the critical moment for cardiopaths in an asystolic condition. Aneurism of the aorta may cause similar accidents.

(*b*) *Cerebral hemorrhage* rarely causes absolutely sudden death. The essential conditions, alteration of the vascular walls and tension of the fluid circulating in them, are found in the existence of albuminuria. The vascular tension is still further increased by labor and by convulsions. Cerebral hemorrhage may occur independently of convulsions, as a result of miliary aneurisms, sclerosis, or varicose veins. Albuminuria is usually present. The patient becomes comatose; respiration is sighing, sometimes irregular and of the Cheyne-Stokes type. Unconsciousness is absolute, irritation of the skin and mucous membrane causing no reflex action. The pupils do not react to light, the pulse gradually weakens, and death occurs during this collapse.

(*c*) The other causes enumerated of sudden death are merely accidental and quite exceptional. A. R. S.

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ORIGINAL COMMUNICATIONS.

HYSTERECTOMY.[1]

INDICATIONS AND TECHNIQUE.

BY

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(With eight illustrations.)

IT is not proposed to discuss in this paper the etiology of the various conditions for which this operation is performed, nor shall the symptomatology and diagnosis occupy more space than is incidentally necessary to the consideration of the indications for the procedure; these points are too thoroughly settled to admit of further debate. The points which are still in dispute are amongst those which will arise during the study of this subject. It is not always safe, in forming conclusions, to draw one's inspiration from a promiscuous collection of statistics, for the reason that it is well known how loosely many of these are reported,

[1] Read before the Section on Gynecology and Abdominal Surgery, Pan-American Medical Congress, Washington, September 6th, 1893.

and how thoroughly unreliable some of them are on account of the desire of the reporter to make as good a showing as his neighbor, in consequence of which many essential facts and truths are omitted. General statistics will therefore be ignored, and whatever deductions are drawn will be entirely from the author's personal experience, which has now reached the number of seventy-seven hysterectomies. The *indications*, as taught by this experience, are absolute and relative. They are:

1. Malignant degenerations of the uterus.
2. Fibroid tumors of the uterus.
3. Pelvic inflammations.
4. Prolapse of the uterus.
5. Inversion of the uterus.

Malignant Degenerations of the Uterus.—The indications here are absolute, both as to the advisability of the operation and as to the complete removal of the organ, it matters little how high the death rate or how high the percentage of recurrence. The disease is incurable and the end certain under any other line of treatment. However small the number of cases cured may be, yet it is an undisputed fact that a certain proportion regain permanent good health. Should this number of fortunate ones be limited even to one or two in the hundred operated upon, it would be sufficient justification. When one considers the great relief which follows a simple curettement of a cancerous uterus, it can well be imagined how much more thorough and prolonged this relief is when the whole organ is removed. The number of permanent cures will be in direct ratio to the period at which surgery is employed: the earlier in the disease the uterus is removed the more chance of obtaining a satisfactory result. For this reason, when, from a careful study of the symptoms and history of a given patient, a reasonably strong suspicion of malignant disease exists, other conditions being rigorously excluded, the uterus should be removed. The justification for acting upon such advice will rest largely upon the mortality attendant upon the operation, as undoubtedly, under these circumstances, an occasional non-malignant uterus will be removed. This will matter little in comparison with the number of patients saved a miserable death; and even though the organ prove not to be cancerous, it will be a diseased one, giving rise to alarming symptoms, from which speedy and permanent relief will be obtained.

Twenty-five operations have been performed for primary can-

cer or sarcoma of the uterus; this number does not include those cases of malignant changes in uterine neoplasms, all of which are considered with the fibroid tumors. Of this number three have died from the operation. The three deaths were all preventable, and would not be likely to occur in another series of the same number. Two of them were the first two operations for vaginal hysterectomy ever performed by the writer. Single clamps on each side of the uterus were used for securing the broad ligaments; in both cases the clamps worked in a faulty manner, and one of the ovarian arteries retracted, after being cut, from the grasp of the clamp. In one case it was necessary to open the abdomen in order to secure the bleeding vessel.

The third death resulted on the fifth day after the removal of the uterus by means of catgut ligatures. The patient was exceedingly restless, the usefulness of the catgut being destroyed by its absorption, the light adhesions gave way and the stumps, which had been stitched into the vaginal opening and which at this time were sloughing, retracted into the pelvic cavity, setting up a septic peritonitis which proved fatal in twenty-four hours.

Experience and a more perfect technique would guard against the repetition of a death similar to the first two; heavier catgut and more thorough suturing, together with a judicious restraint of a restless patient with drugs, would guard against a repetition of the last-mentioned accident.

Fibroid Growths.—The indications for surgical treatment of these conditions are relative. If the tumor be small, is of slow growth, and gives rise to no untoward symptoms, it should be allowed to remain unmolested, provided the patient may be in such a state of life that she is not necessarily exposed to conditions which predispose to inflammatory complications, and that she be not liable to change her place of residence to such quarters that she will be unable to obtain competent surgical aid should there be a future demand for it—a demand which will almost always be made sooner or later. Should the patient have advanced to within a few years of the menopause, it may be advisable to adopt, for the time being, the expectant plan of treatment. Under all other conditions a fibroid tumor of the uterus, however small, should be subjected to surgical treatment. Surgical treatment having been once decided upon, hysterectomy is the proper procedure to adopt. Myomectomy may in rare

cases be the more desirable procedure, but can only be considered where the patient is of such an age as to make it desirable and possible for her to bear children, and where the uterine appendages are healthy and capable of performing their function, the reverse of which is true in the case of the majority of fibroid tumors. Under all other circumstances hysterectomy is the operation of choice. The withdrawal of ovariotomy from the category of operations applicable to the treatment of fibroid tumors is based on the fact that it, equally with hysterectomy, renders it impossible for the woman to conceive; it not only allows the tumor to remain *in situ* for Nature to absorb, with the chance, however slight, of this not occurring, but it usually leaves behind a diseased and useless uterine cavity and uterine walls, all of which may be gotten rid of surely and permanently at one stroke by the hysterectomy. Ovariotomy is often more difficult than hysterectomy, and is not infrequently impossible.

Hysterectomy as the operation of choice will, as in the case of malignancy, depend upon the mortality. The writer has removed forty-one fibroid uteri by means of this operation. Of this number four patients died—three after the supravaginal amputation of the stump, and one after complete extirpation. In the one case death was inevitable from the previous septic condition of the woman, due to electro-puncture. Two of the deaths were due to pulmonary complications; acute congestion of both lungs, in the case of one, ending in death within the first twenty-four hours, and a double pneumonia of the second resulting in rapid filling of both lungs and death within several days. These two deaths occurred in hospital practice within a few days of each other, and at a time when there was an epidemic of pulmonary complications following all kinds of operations in the house. At the time of the deaths there were in the house six or eight cases with lung troubles, some of whom were sick enough to cause considerable anxiety, and on some of whom only plastic operations had been performed. The epidemic abated as abruptly as it commenced. The fourth death was due to septic peritonitis in a case of complete extirpation, and was undoubtedly due to faulty technique, a cause which is entirely preventable.

Pelvic Inflammations.—The indications in pelvic inflammations are relative. All operators are having patients, whose uterine appendages they have removed for this disease, return only slightly or not at all better. The women suffer with their

old pains, leucorrheal discharges, and hemorrhages. In two such cases the writer has subsequently removed the uteri with complete relief of all the symptoms. In two other cases the uterus, together with its appendages, has been removed at the first operation, with a perfectly satisfactory result. In no case was there a death.

In pelvic inflammatory disease in women the infection has first invaded the uterine cavity. In very many cases the endometrium remains permanently diseased and the uterine walls have become invaded by inflammatory products, even with pus. In many cases of pyosalpinx the tissue is so diseased that the ligature cuts through like a knife, even when it is placed well up on the uterus. It is no more to be expected that uterine walls diseased to such a degree will regain their normal condition than to expect the same of the tubal walls under like circumstances. The mortality of hysterectomy under these circumstances should be no greater than after the removal of the appendages alone. This procedure should therefore be the operation of choice in all cases where the uterine walls are infiltrated with pus and the uterus materially enlarged.

Prolapsus Uteri.—The indications are relative. All cases in which the usual surgical means have been tried and failed should be subjected to hysterectomy as a sure means of cure. Women who are suffering from old complete prolapse, near, at, or past the time of change of life, are proper subjects for this procedure. Future child-bearing need not here be taken into consideration. The only questions to be considered are, first, whether or not the usual plastic operations give promise of a cure; second, the mortality of the operation. As to the first, it is well known to all operators that plastic operations, even when accompanied by a ventro-fixation, at times fail. As to the mortality, the uterus has been removed six times by the writer by vaginal hysterectomy without a death, and with complete success in each instance. Cases which are particularly applicable for this treatment are those with greatly enlarged and hypertrophied uteri, measuring five and six inches in depth, accompanied by profuse uterine discharges and hemorrhages. These uteri are not infrequently found to be cancerous, such being so in the case of two of the six reported. The operation should always be followed by plastic operations on the anterior and posterior vaginal walls for a repair of the relaxation of the vagina.

Inversio Uteri.—The operation is only applicable to old, chronic cases, and only then when judicious attempts at replacement by taxis and elastic pressure have failed. Taxis should not be tried longer than half an hour, with the patient under ether. If at the end of this time there is no sign of beginning return, elastic pressure should be resorted to either by the colpeurynter or Aveling's repositor. Should these fail after several days' trial, vaginal hysterectomy is a proper and safe procedure. One case has been successfully treated in this manner by the writer.

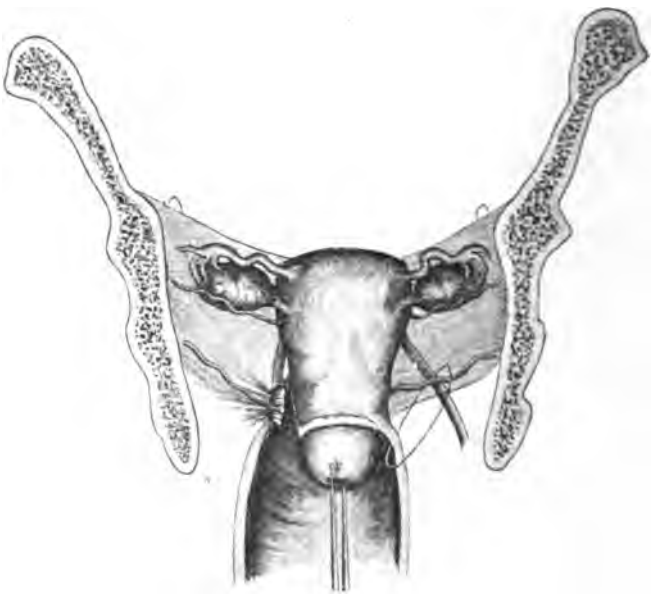


FIG. 1.—Vaginal hysterectomy with the ligature. First step: ligation of uterine arteries.

The methods of performing hysterectomy are abdominal, vaginal, and the combined methods.

Abdominal hysterectomy is performed by—

1. Supravaginal amputation.
 (*a*) Treatment of the stump by the extraperitoneal method.
 (*b*) Dropping the stump.
2. Extirpation.

Vaginal hysterectomy is performed by—

1. Clamp operation.
 (*a*) Single clamp.
 (*b*) Multiple clamps.
2. Ligature operation.

All cases of prolapse and inversion of the uterus, all malignant uteri sufficiently small, and very small fibroid tumors of the uterus are proper subjects for the vaginal operation.

Fibroid tumors, excepting the very small ones, large malignant uteri, and all cases of inflammatory uteri should be subjected to the abdominal operation.

The combined method is superfluous and more dangerous than either of the other two alone.

In the hands of the writer vaginal hysterectomy by means of

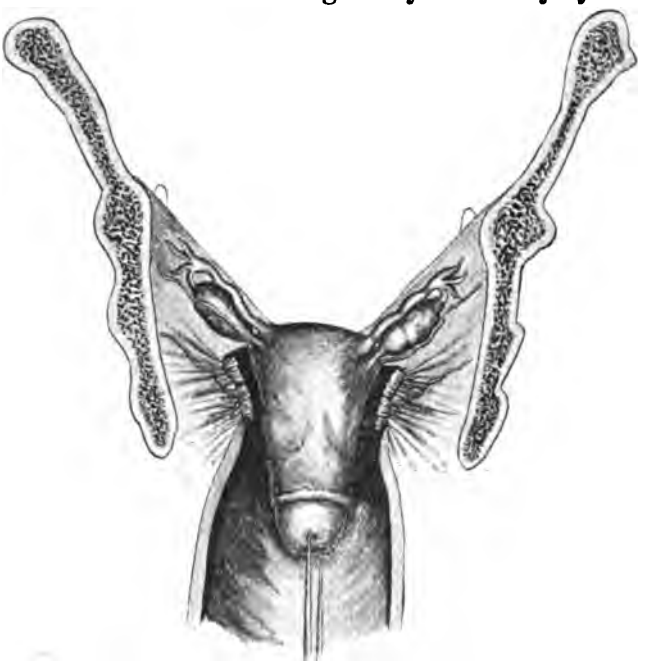


FIG. 2.—Vaginal hysterectomy with the ligature. Second step.

the catgut ligature has proven the safest and most satisfactory of the vaginal operations. With the clamps there were four operations with two deaths, with the catgut ligature there were twenty-seven operations with one death. Where the operation is performed for prolapse, the ligature operation, and stitching the stumps in the opening in the vaginal fornix, is absolutely necessary to success. The broad ligaments are thus made to act as guy ropes from above and give infinitely better support, with less chance of stretching, than would be the case if ventrofixation or Alexander's operation had been relied upon.

When the abdominal operation is performed in the presence

of malignant disease complete extirpation is necessary. In all other cases the supravaginal amputation is preferable. Extirpation is a longer and somewhat more tedious operation, and in addition the subsequent condition of the vagina is that of a considerable shortening; the advantages of this procedure over the amputation do not compensate for these disadvantages. The uterus was removed by complete extirpation five times with one death.

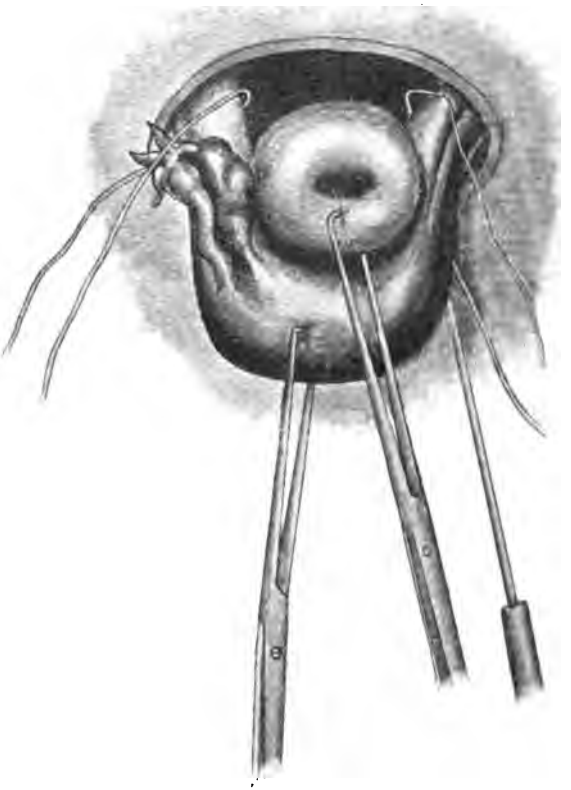


FIG. 3.—Vaginal hysterectomy with the ligature. Third step: the fundus inverted into the vagina, and the final ligatures in place.

As between the two methods of treating the stump, dropping it back into the pelvic cavity is preferable to treating it by the extraperitoneal method. The mortality is much the same, but other considerations all turn the balance in favor of the intrapelvic method. The extraperitoneal method is not applicable to intraligamentary growths. Twenty-eight operations were performed and the stump treated extraperitoneally; of these

two died. Thirteen cases were operated upon and the stump allowed to retract back into the pelvis; of these patients one died.

The supravaginal amputation accomplishes all that extirpation does; is applicable, with the exception of malignant uteri, to all conditions and diseases; is less difficult and tedious of performance; has less danger of septic infection, due to the smaller opening of the cervical canal than of the vagina; and, finally has less mortality. After the ovarian and uterine arteries are ligated and the uterus amputated, the cervical canal should be cauterized by means of the Paquelin cautery, closed by catgut or fine silk sutures, and the edges of the cut peritoneum closed over the stump.

Hysterectomy is a difficult operation, however performed,

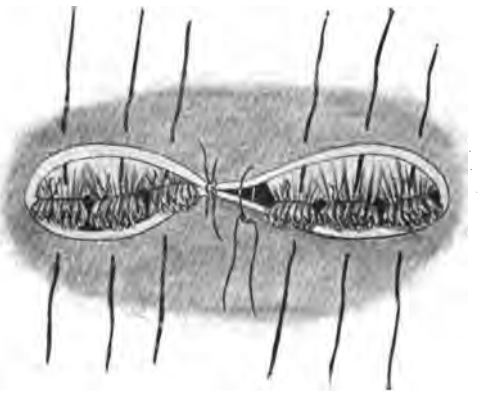


FIG. 4.—Vaginal hysterectomy with the ligature. Final step: uterus removed and stumps drawn down into the vagina; sutures in place ready for closing the vaginal opening.

and should never be undertaken by an incompetent operator. The mortality following the operation when properly performed should to-day be much less than is indicated by seven deaths in seventy-seven operations. It must be borne in mind that this mortality includes the accidents incident to gaining the requisite experience in manipulation, as well as those necessary to perfecting the technique.

The convalescence following hysterectomy is, in the majority of cases, as easy and uninterrupted as that following ovariotomy. A few more years will see the field of applicability of this operation greatly widened, the more so as the mortality decreases. The uterus is a useless organ in all cases where the ovaries or Fallopian tubes have been removed, and is only too frequently a source of discomfort, invalidism, and death.

The *technique* of vaginal and the two varieties of abdominal hysterectomy—complete extirpation, and the intrapelvic treatment of the stump after supravaginal amputation—have many points in common. In each operation the important point is to secure in separate ligatures the two ovarian and two uterine arteries; everything else is subordinate to this. Rigid antisepsis is absolutely necessary.

Vaginal Hysterectomy.—The patient being placed in the dorsal position, the perineum is well retracted with a Sims speculum. The cervix uteri is grasped with a pair of tenaculum forceps and drawn down. The vagina about the posterior portion of the cervix, from broad ligament to broad ligament, is cut loose

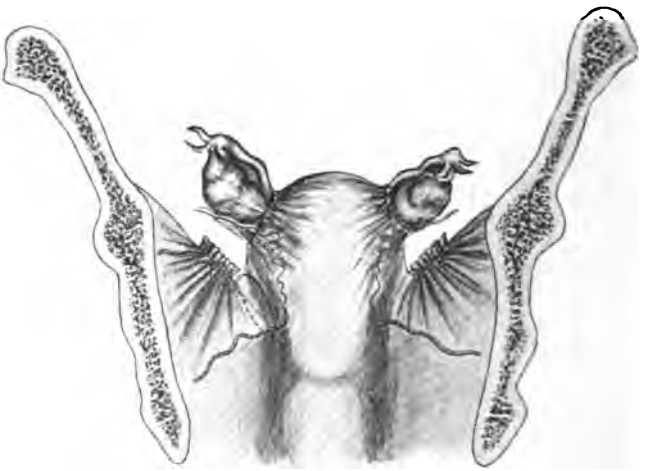


FIG. 5.—Supravaginal amputation of the uterus. First step: ovarian arteries ligated.

with a few strokes of a knife, and its peritoneal and mucous coats quickly whipped together by a continuous suture, to prevent bleeding. The vaginal mucous membrane is now incised on the anterior aspect of the cervix, from broad ligament to broad ligament, well below the attachment of the bladder. The connective-tissue attachments of the bladder to the cervix are loosened by forcing the finger between them and the uterus until the peritoneum is reached. This membrane is quickly penetrated by forcing a pair of blunt hemostatic forceps through it into the peritoneal cavity, and withdrawing them after having first widely separated the blades. Where it is possible the mucosa and serosa are stitched together, as was done posteriorly. The uterus is now entirely free from all its attachments except-

ing the broad ligaments. A succession of ligatures are placed upon these on each side, beginning from below and cutting the uterus free from the ligaments as each successive ligature is placed and tied. Three ligatures usually suffice for each broad ligament. The first one secures the uterine artery; the second includes the balance of the ligament up to the ovarian artery, which, after being tied and cut away, frees the womb sufficiently to allow of inverting the fundus into the vagina; it is thus a simple matter to place the final ligature, which, on each side, includes the ovarian artery. The ligature should be placed on the outer side of ovary and Fallopian tube, so as to allow of cutting



FIG. 6.—Supravaginal amputation of the uterus. Second step: ovarian and uterine arteries ligated and uterus amputated.

between them and the pelvic wall; in this manner both tubes and ovaries are removed with the womb. The uterus being removed, the three stumps on both sides should be drawn well down into the vagina and the vaginal opening closed about them, the sutures being so placed as to pass through the stumps, thus fixing them in their drawn-down position. When the operation is finished, nothing is seen in the vagina but the protruding stumps. The vaginal canal is douched with mercurial solution, well dried, and lightly packed with iodoform gauze, which is to be removed in the course of a few days. Catgut ligatures are used throughout.

Supravaginal Amputation, with Intrapelvic Treatment of the Stump.—The abdomen is opened in the median line, the patient being in Trendelenburg's position, with the intestines well back in the abdomen and the pelvis empty. A ligature is placed on each side of the uterus, close to the pelvic wall, including as much of the broad ligament as possible; a ligature to temporarily prevent bleeding from the uterus is placed close to that organ. After cutting between these ligatures and drawing the womb up, a second ligature is placed, if necessary, on each side, so as to include any remaining broad-ligament tissue, to

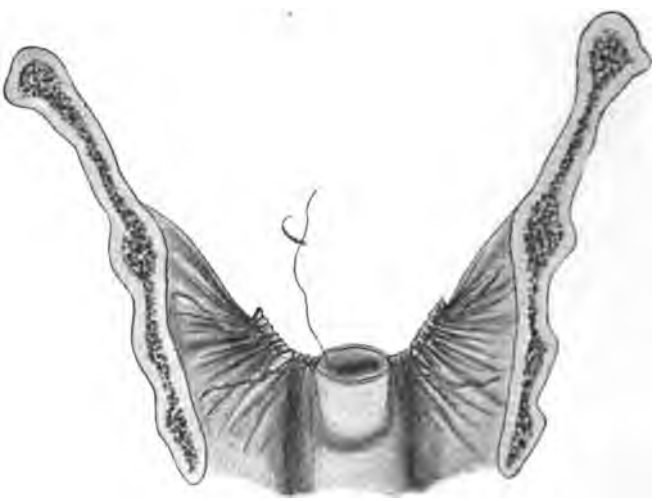


FIG. 7.—Supravaginal amputation of the uterus. Closure of the cervical canal with sutures.

the level of the pelvic floor. These attachments are also severed. The uterus being well drawn up, the uterine artery on either side is located by the finger and a ligature placed under it close to the uterus. After securing this vessel on both sides the uterus is removed as low down on the neck as possible, the amputation being made wedge-shaped. As soon as this is accomplished the cervical canal is cleaned with the knife or a Paquelin cautery, and the cut surfaces of the neck are brought together by several sutures. The peritoneal edges are now whipped together by a running suture from side to side of the pelvis, burying under it the cervix and all the stumps but the ones including the ovarian arteries. Even these may be cov-

ered by doubling the loose peritoneum over them from side to side by the aid of a few sutures, thus completely covering up all raw surfaces.

Complete Extirpation.—The steps of this operation are the same as the preceding up to the point of amputation of the uterus. Instead of this procedure the attachments about the cervix are freed and the uterus removed entire. The peritoneal reflection between the uterus and bladder is incised from side to side, and the bladder connective-tissue attachments gently sundered with the finger or the handle of the knife. The vaginal sheath, being reached, is opened, and with a finger in the

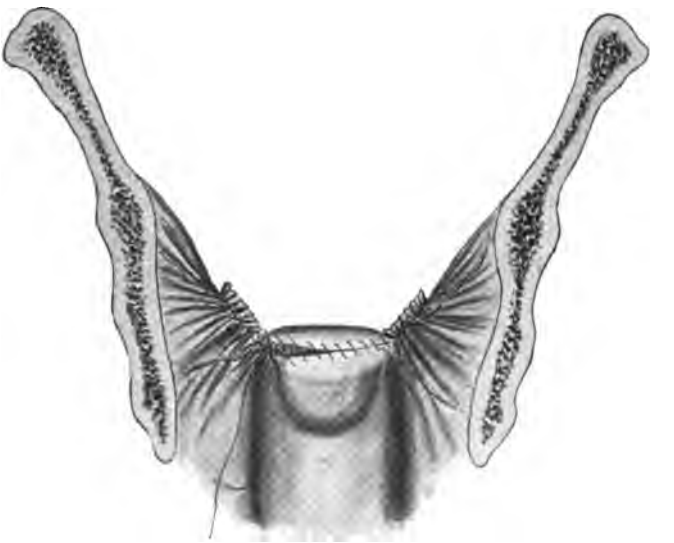


FIG. 8.—Supravaginal amputation of the uterus. Suture of the peritoneum over the cervix and stumps.

vagina it is no very difficult matter to free the attachments from the complete circumference of the cervix. This being accomplished, the edges of the vagina are brought together by a continuous suture. Thus any danger of infection getting into the raw surfaces from that canal is obviated. The peritoneal edges are sutured in a similar manner as in the preceding operation, all the stumps but the topmost ones being turned into the space between the vagina and peritoneum. Silk is used for the ligatures on the arteries, catgut for all suturing.

Drainage in any of these three operations is superfluous.

THE TECHNIQUE OF TOTAL EXTIRPATION OF THE FIBROMATOUS UTERUS.[1]

BY

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THE minority of all cases of fibroma or myoma of the uterus calls for any treatment, either medical or surgical.

When treatment is called for the author believes surgery is invariably to be preferred to any and every other method of therapeusis. This statement, of course, is based on the assumption that whatever method of treatment, medical or surgical, be decided upon will be carried out by those most competent in that special method.

Small submucous fibromata that can be safely removed through the cervix and vagina are best dealt with in that way, provided that the entire disease can be thus eradicated. This latter proviso will obtain, however, in only very exceptional instances as compared with the total number of fibromata demanding operative interference.

Salpingo-oöphorectomy, celio-myomectomy, and celio-hysterectomy are the other surgical resources, in the rising scale, at our command. Each has its proper indications and place. To enter upon a discussion of these indications is not the purpose of this paper. In relation to the two former—removal of the ovaries and tubes, and enucleation of the tumor or tumors with added salpingo-oöphorectomy—the author merely wishes to state that his results obtained from these methods have been sufficiently satisfactory to warrant him in the continuance of their employment in properly selected cases of fibroma and myoma of the uterus.

When hysterectomy is the only alternative left, total extirpation of the uterus has always appealed with stronger force to the writer's ideas of surgery than amputation through the cer-

[1] Read before the Section on Gynecology and Abdominal Surgery, Pan-American Medical Congress, Washington, September 7th, 1893.

vix, no matter which of the many methods now in vogue of disposal of the resultant stump, either extra- or intraperitoneal, be resorted to. So strongly has this conviction swayed the author's practice that he has absolutely no experience with the treatment of the stump in abdominal hysterectomy, all of his cases of hysterectomy having ended in total extirpation of the uterus.

Just here I may be permitted to allude to the misuse of the term hysterectomy—an abuse sanctioned by long usage.

Hysterectomy means literally cutting out the uterus, and there is nothing in the term which would justify a rational application of it to supravaginal amputation. The term hysterectomy having been thus (mis)appropriated to denote supravaginal amputation, I have been in the habit, for some years past, of using the tautological term "panhysterectomy" when speaking of total extirpation of the uterus. While this expedient was perhaps excusable in view of the circumstances and in the transition period of the development of the subject, the time has now arrived when, in the interests of clearness and a correct nomenclature, the term hysterectomy should be reserved to apply to total extirpation of the uterus; celio-hysterectomy and colpo-hysterectomy to denote respectively extirpation *via* the abdomen or *via* the vagina.

The author is convinced that the adherents of hysterectomy, as compared with supravaginal amputation, would increase in number were it not that total extirpation is generally regarded as the more dangerous operation. That it is not more dangerous, and quite possibly even less dangerous, in competent hands, larger statistics may, from present indications, soon be expected to show. That total extirpation is a more difficult operation the writer also believes to be an opinion based upon prejudice and want of familiarity with the procedure. The main object of this communication is to detail a technique of total extirpation of the fibromatous uterus which, albeit in a limited experience, has proven entirely satisfactory to the writer, and without further delay I will address myself to my subject.

The patient is placed in the lithotomy position and the vagina thoroughly disinfected in the usual way. The cavity of the uterus is disinfected, as far as possible in each individual case, by means of superficial curettage and irrigation with 1 : 2000 sublimate solution. The uterine cavity is packed moderately

with antiseptic gauze, usually 1:1000 sublimate. The vagina is next packed tightly with 1:1000 sublimate gauze and the patient changed to the Trendelenburg posture. The abdomen is opened above the pubis by an incision just large enough to permit the delivery of the entire tumor.

If the ovaries and tubes are found healthy, or at least not containing pathological secretions the escape of which would threaten infection of the peritoneum, and the uterine tumor not too large, extending but little, if any, above the umbilicus, and not weighing above four kilogrammes, the entire uterus, with the tumor or tumors, tubes and ovaries, is removed in one piece after the following method:

The tumor is delivered through the abdominal incision and pulled as far as possible out of the pelvis. A transverse incision is made through the peritoneum covering the anterior surface of the uterus from one broad ligament across to the other. This incision runs about three centimetres above and parallel to the reflection of the peritoneum from the uterus on to the bladder. The point of reflection is plainly indicated by a white, fibrous-looking transverse line. A similar transverse incision is carried through the peritoneum on the posterior surface of the uterus. The two peritoneal flaps thus marked out should be large enough to easily cover the defect in the pelvic floor left after removal of the uterus.

The peritoneal flaps are next stripped from the surface of the uterus. In doing this the bladder and ureters are carried forward with the anterior flap well out of the way of harm during the further steps of the operation.

The next step is the ligation of the uterine artery on either side. The arteries are secured by a subperitoneal mass ligature of stout catgut, carried well down to, but not into, the vagina. The distention of the vagina by the gauze packing makes this an easy matter, a point for counter-pressure being afforded by the gauze. In passing the ligatures in this, as well as in all other operations upon the broad ligaments, I prefer the excellent and most convenient ligature carrier devised by Dr. Clement Cleveland to all other instruments.

The broad ligaments are tied off by two further catgut ligatures on either side, one embracing the round ligament and the other the infundibulo-pelvic ligament and spermatic artery. The cutting-out of the uterus, tumor, and appendages in one

piece between the ligatures is now an easy and bloodless procedure. If the mass ligature of the uterine arteries has been correctly applied no bleeding will result, even from the divided vaginal arteries. The six ligatures are cut short and the knots turned downward toward the vagina in the next step of the operation—the closing of the gap in the pelvic floor.

This is effected by uniting the anterior and posterior peritoneal flaps by a transverse, running Lembert suture of catgut extending from the stump of one infundibulo-pelvic ligament across to that of the other, securely shutting off the peritoneal cavity from the vagina.

The peritoneum is dry-cleansed with sterilized gauze, the abdominal wound closed without drainage, and the patient returned to the lithotomy position. The gauze packing is removed from the vagina and replaced by a loose dressing of gauze applied in such a manner as to drain the supravaginal subperitoneal space. The patient is now ready for bed.

Modifications of the above plan are called for by certain conditions. Thus, if the ovaries or tubes present evidences or suspicion of containing infectious material, they should be tied off and removed the first thing after opening the abdomen. If the tumor extend above the umbilicus, weighing more than about four kilogrammes, pass a rubber ligature around the cervical part, after stripping back the peritoneal flaps, amputate the bulk of the tumor, cauterize the cervical canal with the Paquelin or a tablet of corrosive sublimate, and remove the cervix in the manner described above. If multiple or intraligamentous fibromata fill the pelvis, make room by enucleating the fibroma or fibromata most in the way, and proceed as above.

The technique of total extirpation of the uterus above advocated is believed to possess the following advantages:

1. The danger of infection from the uterus or vagina is entirely avoided, or at least minimized. The cleansing of the vagina and uterus, and packing the latter with gauze, is a measure of precaution against infection which I take previous to all celiotomies, for whatever cause, in which there is a possibility that the uterine cavity may be opened from the abdominal side during the operation. In operating for the removal of fibromata the uterine cavity may be opened in the enucleation of a tumor or in amputation of the bulk of the tumor, and it may

make the difference between life and death to find it in an aseptic condition.

2. The uterine arteries are secured with ease and certainty. The distention of the vagina by the gauze packing enables us to carry the mass ligature well down to the vagina and to include the supply to the upper end of the vagina as well, so that there will be no bleeding of the vaginal arteries after cutting out the uterus.

3. The operation is practically bloodless. With the exception of the incision through the peritoneum fore and aft, no part is divided until its blood supply has been secured.

4. The danger of wounding the bladder or ureters is reduced to a minimum. These organs are lifted with the anterior peritoneal flap well out of the field of operation.

5. The closure of the peritoneum is as perfect as it can be made, its *status quo ante* is restored, and no foreign body is left in its cavity.

6. The after-treatment required is practically *nil*. My patients have generally left bed at the end of two, and hospital at the end of three, weeks.

The author has performed total extirpation of the uterus for fibromata but six times, the last four cases being operated upon after the above-described method. All of the six patients recovered from the operation, though one died a sudden death some time afterward as a result of degenerative changes of the muscles of the heart antedating operation. The time required for the first of the four operations performed as described in this paper was one and a half hours. The last three were performed in or within an hour, the time being reckoned from the beginning of disinfection of the vaginal tract until the patient was ready for bed, and including the curettage of the uterus, the cleansing of the abdominal walls, and two changes of position, from the lithotomy to the Trendelenburg and back. None of the tumors, however, was exceptionally large. They varied from fifteen to twenty-four centimetres in average diameter, and between three and a half and five and a quarter pounds in weight. The smallest reached to within three centimetres of the umbilicus, and the largest extended to some five centimetres above the navel.

It is with extreme diffidence I present this paper, based, as it is, upon such a limited experience, before such a body of repre-

sentative men, many of whom number operations of this character by the score. It is in the hope of eliciting a discussion, from which we may all derive benefit, that it is hazarded.

198 SECOND AVENUE, NEW YORK.

VAGINAL HYSTERECTOMY.[1]

BY

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THE removal of the uterus through the vagina for malignant disease was the subject of earnest discussion in the International Congress held in this city in 1887. It had its earnest advocates and its equally determined opponents. Its probably large mortality was condemned, its efficacy questioned. To-day it is one of the accepted operations of surgery. Without question there are now but few who would prefer, in any case, to temporize by partial measures, such as amputation of the cervix, high or low, when we can remove the entire organ in which the disease has had its nidus, with as slight a mortality as attends the excision of the uterus.

Arguments in advocacy of the greater safety by the removal of a portion of the organ avail nothing if it can be shown that the entire organ can be excised with a very small mortality. It must be apparent to the most prejudiced mind that there is more hope for the future escape of the patient through extirpation than in the removal of the cervix.

In some of my own cases there was disease of both body and cervix, apparently independent of each other. The amputation of the cervix could have been made in healthy tissue, and still have left more marked disease in the cavity of the uterus, which would have been accepted as a relapse had the latter procedure been chosen.

Indications.—In selecting suitable cases for this operation

[1] Read before the Section on Gynecology and Abdominal Surgery of the Pan-American Medical Congress.

there should be no question as to its advisability whenever the disease is limited to the uterus, whether cervix, canal, or body be the seat of its development. As has been frequently recognized, the disease progresses to a greater degree in the mucous membrane in which it originates, and it is difficult, from microscopical appearances, to determine when it has passed beyond the line at which the amputation can be conveniently made.

That the disease is confined to the uterus is determined by the mobility of the organ upon vaginal and rectal examination, the absence of any extension of the disease upon the anterior or posterior walls of the vagina, and failure to discover by rectal touch the presence of infiltrate or nodular projections in the posterior surfaces of the broad ligaments.

Not every case of fixation of the uterus or apparent peritoneal infiltration should be considered a contra-indication to operation, as it may have been caused by previous inflammation rather than by malignant disease. The history will often afford us light as to its true character, for in malignant infiltration the smooth surface is absent and supplanted by nodules or tubercles; the mucous surfaces of vagina and rectum over the infected parts are fixed, immovable, and indurated. In inflammatory attacks the mucous membrane may be displaced and stretched, but is never infiltrated. The excision of the uterus need not be confined to malignant disease. It has been in late years practised and warmly advocated by many French operators in inflammatory diseases of the pelvis, to supplement the removal of the appendages. The wisdom of such a procedure is still *sub judice*. It may well be advocated in some forms of small fibroid where free and persistent hemorrhage is the rule; also in prolapse of the uterus of marked degree, with ulceration of the neck, where amputation must result in cicatricial contraction and in acquired stenosis of the cervix, or where the greater part of the canal has become occluded through injuries of parturition. The operation is contra-indicated wherever the disease has extended beyond the limits of the uterus, involving structures that cannot be safely or effectually removed, whether upon the vagina, through the broad ligaments, or into the lymphatic glands of the pelvis.

It is sometimes exceedingly difficult to determine when the line has been reached beyond which it is unwise to operate. A patient came under my observation in September, 1892, whose

cervix was destroyed flush with, or even above, the level of the vagina, and in removing the organ an apparently diseased lymphatic as large as a hickorynut was enucleated from one side of the uterus. But little hope was entertained of immunity from a relapse, but she is now, nine months later, in better health than she has had for many years, with apparently no indication of a return of the disease.

When the uterus is movable, and the broad ligaments are not infiltrated to such a degree as to render them incapable of withstanding the pressure of a ligature or a clamp, it would seem wise to select the operation of extirpation. The specialist, unfortunately, finds the progress of the disease so marked when the patient first comes under observation that the period for a hopeful operation has passed, and he is confronted with a condition for which but little more than palliation can be expected. This delay is often occasioned by disinclination upon the part of the patient to submit to physical examination; she acts upon the counsel of her elder female acquaintances, who assure her that her symptoms are premonitory to the coming change of life, and the woman patiently bears her loss from blood and watery discharge until it becomes painfully evident that the promised change will be a translation to another sphere. Less frequently than formerly, yet too often, her medical adviser, without even the semblance of an examination, prescribes ergot or an astringent and assures her that the menopause will make all right.

It should be remembered that while the period of the climacteric and later years predispose to the development of malignant disease, it is by no means limited to it, but has been found in women as young as 20.

In the twenty-one cases upon which this paper is based, five, all with undoubted epithelioma of the cervix, were under 40 years of age. The symptoms which should lead the physician to suspect serious disease, and which should lead him to demand a physical examination as the price of his continued attendance, are hemorrhage, pain, and a thin, watery discharge—hemorrhage in the form of an increased flow at the menstrual periods or excited in the intervals by exercise, straining, or coition. In women in whom the menopause has occurred it may be in the form of a slight flow occurring occasionally, which leads her to believe that the menses are returning; or there may be a smart

hemorrhage, and nothing more occurs for several months, when another takes place. Hemorrhage or irregular bleeding is generally the first symptom, though it may be preceded by either pain or leucorrhea, more frequently the latter. This discharge is thin, having the consistence of water, and emits an exceedingly offensive odor similar to that of decaying or putrid flesh. It may be quite free or slight in character; while generally a turbid or milky fluid, it may frequently be stained with blood.

Pain is intermittent, more frequently occurring in the afterpart of the day and at night. It may radiate from the uterus into the sacrum and down the limbs, or be recognized as an intense grinding pain in the uterus or the sacrum. As the disease progresses the pain becomes more intense and persistent, until it is absolutely unendurable unless modified by anodynes. While pain is the symptom most dreaded, it is the one most frequently absent. Patients not infrequently go to the last stages of the disease without any suffering, and it is sometimes difficult to convince physician and patient of the gravity of the condition, on account of its absence.

The existence of any of these symptoms should awaken the physician to the importance of a careful examination. No patient should be permitted to go unadvised of the possible gravity of her state when she declines an examination. The disease will usually be found affecting one or other lip of the cervical canal. Where extensive it results in marked infiltration, cauliflower growths, or ulceration. There should be no difficulty in arriving at a diagnosis. If in doubt a section may be removed and subjected to microscopic investigation. If the cervix presents no indication of disease, and careful examination of the pelvis fails to reveal any cause for the symptoms, the uterine canal should be dilated and the cavity explored with the curette or finger.

In malignant disease there will generally be found a mass of broken-down tissue situated upon a more or less indurated base. The examination, unless carefully done, will be provocative of severe hemorrhage.

Preparation.—When the operation has been decided upon it is advisable to delay it as short a time as is consistent with a proper preparation. The suspected character of the disease and the dread of the operation are urgent reasons against unnecessary delay. The patient should be put to bed, be given a free

purgative, subjected to antiseptic vaginal douches, and, several days before the operation, the vagina should be carefully cleansed with a solution of creolin and tincture of green soap, then the diseased tissue carefully cut away with sharp curette and scissors, the cavity and vagina irrigated with a hot sublimate douche 1:2000, dried, and packed with iodoform gauze. Later this packing should be removed, the vagina cleansed and repacked. The latter packing may remain until the time of operation, when it should be removed and the cavity and external surfaces carefully cleansed with the creolin and soap solution and finally irrigated with hot sterilized water. The external surfaces should have been previously shaved.

Operation.—The patient is anesthetized, placed in the lithotomy position upon a suitable table, and the uterus exposed by an Edebohls speculum or laterally by retractors. It is seized preferably with a three- or four-pronged volsella, as the latter will afford opportunity to catch more tissue and give a more secure grasp than can be exercised with the more common two-pronged instrument. The uterus is drawn down, and with the knife the vaginal mucous membrane is cut through, encircling the cervix as far away from the affected tissues as is consistent with the safety of the ureters and the bladder. The tissues are pushed off from the anterior surface until the vesico-uterine fold of the peritoneum is reached, and posteriorly, also, to the peritoneum. Laterally the tissues are pushed back. The more thoroughly this is done the less likely will the ureters be injured or compressed. The surfaces are irrigated with hot water, dried, and the peritoneum opened in the retro-uterine pouch. A sponge with a tape or string attached is passed into the cavity to keep the intestines back and prevent their being soiled. The anterior peritoneal fold is opened; the finger introduced behind the uterus and carried over the left broad ligament as a guide; the female blade of the modified Greig Smith clamp is carried upward, and, by depressing the external end, the upper is made to appear above the ligament. The other blade is projected into this from in front of the ligament, and the clamp locked and firmly screwed down. The ligament is divided between the clamp and the uterus. If the uterus is large and a little difficult to get around, it may be delivered and the other clamp applied externally, exercising the precaution to make sure before locking it that its upper extremity can be returned to the pelvis

without impinging against the bladder. After it is firmly secured the uterus is cut away and the sponge withdrawn. The clamps are held to either side and the cavity irrigated. Any spurting vessels may be secured with hemostats, though this is generally unnecessary. By drawing first upon one clamp and then upon the other, some iodoform gauze is carried above the end of each and the vagina between them lightly packed.

This packing is made with one strip of gauze. The gauze thus applied, while serving as an excellent means of drainage, prevents the contact of loops of intestine with the ends of the clamps and prevents the former from making unfortunate adhesions. The patient is placed in bed and the usual means exercised to prevent or overcome shock. The shock is sometimes profound, even when the operation is of short duration, probably due to the crushing of the nerves of the broad ligament by the clamp.

The great advantages of the clamp over the ligature are: (1) its ease of application, enabling the operator to economize valuable time; (2) the greater security against hemorrhage—the ligature, though apparently securely tied, may slip from the stump when the latter shrinks after removal of the uterus; (3) we have no infected ligature to complicate or delay the subsequent convalescence; (4) by the traction upon the clamps we are enabled to carry the gauze above the lacerated surfaces and pen the intestines within the peritoneal-lined cavity, thus affording ready exit for any sloughing tissue devitalized by the pressure of the instruments.

The clamps are removed at the end of twenty-four hours, while the gauze tampon is permitted to remain for three or four days longer, unless some indications present for its earlier removal. After the withdrawal of the gauze a douche of sulphurous acid 1:20 is used two or three times in the twenty-four hours. The catheter is used while the gauze remains; afterward the patient may be permitted to void her urine.

She may be permitted to have an extra pillow at the end of a week, a bed rest in ten days, and allowed to sit up in two weeks. The convalescence is generally uninterrupted, and much less likely to be influenced by septic processes than in abdominal operations.

Accidents.—The most likely complications of the operation are injuries of the bladder or the ureters, and hemorrhage.

Where the disease has extended up on the vagina, or the cervix is completely destroyed, it is exceedingly difficult, in our efforts to keep well outside the limits of the disease, to avoid opening the bladder or cutting a ureter.

In my second operation I introduced a uterine sound into the bladder to determine its lower margin, and placed it in the hands of an assistant. As I proceeded with the dissection I was much alarmed and disgusted to see the point projecting into the vagina. When attention was directed to it the assistant withdrew it and the opening could not be discovered. The accident had no influence upon the result, as the patient recovered without an unfavorable symptom. In my twentieth patient the cervix was entirely destroyed. In encircling the diseased surface I felt very fearful that I would open the bladder, so was not surprised to find that later urine was passing by the vagina. Three weeks after the operation a careful examination was made, but the point from which the urine escaped could not be recognized; the bladder was injected with milk, but none of it escaped into the vagina, rendering it evident that the bladder was uninjured. The quantity of urine escaping through the vagina steadily diminished, while there was no change in the quantity voided through the urethra. I presume this patient had received an injury of one side of a ureter, forming a ureterovaginal fistula, and this opening contracted, causing the entire urine to pass into the bladder.

Hemorrhage may occur from the cutting of anomalous arteries, or the ligature or clamp may slip from the lateral ligament.

In one patient, as the operation was completed, some movement was made with one clamp which had not been accurately adjusted, and it slipped off, permitting free bleeding. The bleeding vessels were secured by clamps by drawing down one portion after another of the ligament until the entire cut surface was secured. The accident seemed to have no influence upon the result.

Results.—The value of any procedure must be decided upon its merits. In the consideration of this operation we have two important questions to decide: 1. Is the operation one especially dangerous to life? 2. Does it afford sufficient hope of cure to justify the physician in recommending it, and the patient in submitting to the discomfort and danger? In the discussion of

these questions I do not propose to do more than to analyze the twenty-one cases upon which this paper is based. I am quite well aware that in doing so I am subjecting myself to criticism upon the small number of cases; but a procedure that will permit of twenty recoveries out of twenty-one operations certainly cannot be considered a very dangerous one.

The fatal case was the third operation, and took place upon the fourteenth day from tetanus.

A mortality of less than five per cent compares very favorably with the work in the abdomen and pelvis often done for conditions of much less gravity.

As to the second question, the patient is suffering from a condition for which, so far, medical skill has provided no adequate remedy other than the knife. Returning to our notes, we find that in sixteen of the twenty-one cases some form of cancer was absolutely demonstrated by the macroscopical and microscopical appearances of the affected tissues of these cases. Eleven are still living, two are suffering, one of whom underwent operation seven months since, the other four months.

Nine patients are in good health, one of whom has survived within one month of five years, one nearly four years, one over three, and the remainder for periods varying from four months to nearly two years.

The patients who have died generally showed symptoms of relapse within two months after the operation, and death took place in from three to twelve months.

We feel that these statements are sufficient to demonstrate the expediency of the procedure. The remaining five cases were operated upon for fibroid growths which were causing profuse hemorrhage and a lowered vitality. One of this series has since been reported to have died of cancer of the mammary gland. The other four are in good health.

THE EXTRAPERITONEAL TREATMENT OF THE STUMP IN SUPRAVAGINAL HYSTERECTOMY.[1]

BY

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In approaching this much-mooted question of surgery I am constrained to beg in advance the patient hearing of those who agree with me, and the careful consideration of those who are inclined to follow after the strange gods of innovation. In surgery, as in all else, there comes a time when it seems as if the old had outlasted the period of its usefulness, sinking into what might be called persistent but devitalized animation, falling short but never yielding, necessitating the vigorous push of innovation to make it quit its persistent but senseless grasp. Such is the logic of those who, in the operation of supravaginal hysterectomy, would have us abandon the old for the later methods of treating the pedicle. The logic of their position, while not always clear, never lacks in assertion, and, while sometimes scanty of facts, atones for failure in this respect by a wealth of imagination.

"Sir," said a celebrated member of Parliament, "the gentleman relies upon his memory for his wit and upon his imagination for his facts," and in the same category must be placed some, many, of the statements concerning the assertions both against the extraperitoneal treatment of the pedicle and for the sub-, intra-, or, what you will, revised, eliminated, and improved procedure. As an illustration of the mare's nest the opponents of the older method find in which to hatch out the calamities of the procedure, evidence the following. In a recent paper on the subject a prominent operator says: "The ordinary operation, which is the final resort in such cases, offers few attractions to the surgeon. Most of the surgeons who perform it in the United Kingdom have, at some time or other in the course of their experience, expressed dislike or even 'de-

[1] Read before the Section on Gynecology and Abdominal Surgery, Pan-American Medical Congress.

testation of it.' The proceedings involve abdominal section, a large incision being necessary, the dragging forward of the uterus with its mass of tumor, strangulation of the broad ligament and tumor by a piano wire, or its equivalent appliance, passed around some portion which shows nearest approach to a neck, if such exists, and cutting off of the tumor mass. Whatever may be the details of the method which may be adopted for securing the stump and protecting the peritoneal cavity, two objectionable results are inherent in the operation: first, the sloughing, with more or less fetor and pus formation, of the strangulated portion; and, second, the existence of a band of tissue from the uterus to the lower angle of the wound—a sort of potential bowel trap for the rest of the patient's life. Some operators also refer to the tension of the uterus under the strangulating wire, and the occasional dragging upon the bowel with sometimes fatal consequences, either immediate or remote. My experience of this operation leads me thoroughly to sympathize with the aversion expressed by some surgeons. . . ."

With Hamlet we are ready to exclaim, "Angels and ministers of grace, defend us!" but gratitude shall take the place of imprecation, and we are truly grateful to our foreign confrère, estimable gentleman as he is, for thus exposing his faulty understanding of the operation he so freely criticises to its detriment. And now, to state the case clearly in order to have a clean basis for argument, what are we asked to do in this matter? I submit a reply as follows: Lay aside experience; accept theory and the dictum of those who for the most part have had no experience, but who seek to establish their assertions by a few cases, none of which are crucial, and avoid the issue in those in which they are forced to confess their improvement not only does not improve, but will not apply at all. And unfortunately, also, we are asked to condemn the old operation, from the understanding of those who, as the quoted condemnation amply proves, do not understand it at all. This matter has come down to what in theology is called "polemics," and I submit that it is not theory but surgery that we want; not ink, but ideas; not the disgust of failures, but a faith, a belief, and a zeal according to knowledge. Let us see. The above description is as vague as a somnambulistic wandering. The neud, according to him, is passed around some portion of the tumor which shows the nearest approach to a neck, if such exists. He

does not tell us where it is put if no neck is found. My own suggestion on this line is that it be put around the neck of the surgeon who operates in this fashion. Here let me boldly assert that, whether a neck is or is not present on the tumor, a surgical pedicle can always be made in all cases in which the tumor is at all removable. This has been my experience in one hundred and eleven cases involving growths of all kinds, adhesions of all kinds—bowel, pelvic, and omental, and of the bladder. The abandonment of any operation on account of inability to make a stump, or preferably pedicle, has not occurred at all in my own experience, and therein lies one great superiority of the method —to wit, that it is applicable to all cases in which any stump can be made, and need not be abandoned for some other method in bad cases. This is no mere assertion. Witnesses for the reality of these claims are at hand on all sides. So far as "detestation" of the operation is concerned, there is a magnitude and uncertainty of the extent of implication and complication of every hysterectomy that must make every surgeon of experience dread them; but, so far as dreading the clamp or neud, I for one, when I have the pedicle secured in the never-failing hold of a well-placed delta wire, must confess to a feeling of victory won and a sense of security that has no doubt of safety for my patient. As to the assertion of the inevitable sloughing that occurs in the pedicle, and the accompanying fetor, I yield the palm of censure to those who have it and make it and confess to it. There is no use of apology or explanation. They are right in abandoning the method. That such calamity must occur according to the method previously referred to and quoted is patent to all; but that, I submit, is not the surgery of the operation, no more than strangulation on the gallows is death by the guillotine, and the opponents of the operation are exactly right, from their own understanding and practice, in attaching to it all the opprobria they feel they merit. As a matter of fact, suppuration and fetor do not follow the use of the serre-neud, for the simple reason that the tumor is not strangulated *en masse*, and the process of its elimination is one of continual constriction and desiccation, without odor or even oozing; and so far as the stump is concerned, the use of the drainage tube is not indicated. When this is used there is reason found in complications entirely apart from the formation of the pedicle. As to the "potential" bowel trap by reason of the band of adhesions in the

lower angle of the wound, I confess to an admiration for the term applied. Grammatically it is correct, surgically it is misleading. The potential mood is one of possibilities, but here we do not care to imagine what may, can, might, could, or would happen, but what is. It would have been more to the point to have cited the real, proven danger of this factor, and not to have used it as an argument to conjure with.

What, then, have we been asked to do in this matter? I reply, to take and act upon the criticism of operators absolutely at sea in their understanding of the pedicle operation and of its behavior. Their condemnation of it, for the most part, with few exceptions, lies in the fact that they have failed in it and therefore they seek something new; and in order to establish this new order of things wholesale assertion takes the place of experience, and misconception is judge and jury in the case. Let us consider their argument from their standpoint. First the uterine arteries are tied. This is a desideratum and a *sine qua non*. But this does not answer, and to control hemorrhage bleeding points in the tumor must be tied off. Here, it is well to remember, we are met with the anatomical fact that in the uterus there are sinuses rather than vessels, and this fact will explain the great ooze found in about all of Sinclair's cases, necessitating the drainage tube. This is not present where the neud is used. It becomes at once patent that here is a condition in which ligaturing does not ligature.

While it is thus evident that simple tying of bleeding points does not control hemorrhage, there is still further proof that the structures met in the pedicle or stump do not yield at once to ligaturing or even strong compression. When the neud is applied and firmly tightened until every particle of oozing disappears, as the dressing of the wound goes on, or even while the stitches are being put in the abdominal incision, only a few minutes elapse until bleeding is again renewed and it is necessary again to tighten up the neud. This does not happen once but many times during the first few hours subsequent to operation. It at once becomes apparent, therefore, that the stump is shrinking, condensing on itself, separating itself from its serous constituents—the very process by which its dryness and freedom from all slough and gangrene is guaranteed. This is a step and a peculiarity concerning which the critics of the operation are apparently ignorant *in toto*. To say, therefore, that there is no

essential difference between the ovarian and uterine stump is simply the grossest misrepresentation. The uterine tissue, disorganized by fibrous growth, does not receive ligatures kindly, neither is there present in its structures the resistant force found in the ligamentous structures of the ovarian pedicle. In using the need to control the bleeding pedicle the entire mass is brought outside the peritoneum with not a single ligature within it. The contrast in the intraperitoneal method is wide when we consider the number of ligatures required, and the real uncertainty, in placing any one of these, as to whether it is going to hold. All operators of experience dread the placing of a multitude of ligatures in the abdominal cavity, and the bigger they are the more danger of after ill-effects from them. In addition to this objection comes in the important element of time required to place them. It is all well enough to argue about time and taking care to reduce the dangers of long operations from ether and shock, but it is the business of the surgeon to avoid a long operation when a short one will do, and in addition have all care taken of the patient. If the truth were known, it is the time element that causes most deaths from heart failure, collapse, and the like. The removal of a fibroid uterus, when the adhesions are universal, is bound to be a comparatively lengthy operation outside the mere technique of its removal, and this, therefore, should be the simplest and safest possible. Under this head I may again notice, I trust for the last time, the criticisms of the scientific side of the operation. The advocates of the intraperitoneal method have all at once become sticklers for science. And herein is a vast contrast with their knowledge. The poet says:

> "Knowledge is proud that she has learned so much;
> Wisdom is humble that she knows no more."

It would be a distinct gain to our scientific knowledge of this subject had its critics the wisdom to learn all about it before they discuss it.

The strangulation of the stump is crude, barbarous, unscientific, yet these same men do not hesitate to plunge a needle boldly down into the uterine structures, on either side, to control the uterine arteries. And the tissue comprised in these ligatures of itself would make a fair-sized stump. Constriction by ligature is only different in degree, not in essentials, from snaring by the

neud. "Scientific," so far as surgery is concerned, should mean successful, safe, and able to show results. I take it that the general understanding of the word as applying to real knowledge should also be here considered.

The trouble with many of the critics of the method under consideration is that they have neither the knowledge of the method nor the art to apply it.

A great deal has been said about the statistics of the operation, about Fritsch's having abandoned it, although his mortality was brought down to seven per cent by its application. This in reality amounts to nothing. Mr. Keith abandoned surgery of these tumors for electricity, so we are made to think, yet Mr. Sinclair does not hesitate to tell us how it was necessary in several of his cases to resort to surgery after the trial of Apostoli's faith cure. On the other hand, Martin unhesitatingly abandons the intraperitoneal method and is seeking for a more excellent way. I wish he were here to speak for himself; and certainly, when we consider his wonderful dexterity, which seemingly is never lost for an expedient nor stumbles on itself, his dictum must count for a great deal. That I or any one should be anxious to better our methods is a natural desire of saving life and lessening mortality, no matter by how small a degree; but I cannot abandon the certain for the uncertain. The great misfortune is that in the desired substitution of this new for the old operation a dozen or two of cases are put alongside of twenty years' experience, and the essential difference of nature and numbers is not taken into consideration at all. Bantock's argument is at once pungent and to the point. I quote it *in extenso:* "As I have already pointed out, the author's cases were all favorable for the application of this method, but when he shall have had a long series of cases I feel confident that he will find the exceptions more numerous than he at present dreams, unless he makes a careful selection—a proceeding that would at once vitiate his position. It is only proper here to remark that the great shrinkage of the flaps in the intraperitoneal method has also been observed, and that therefore this matter, in the hands of operators advocating the latter procedure, has at once become a denial and a confession.

"The treatment of the cervical canal in the intraperitoneal management of the stump is a rock upon which its exponents

split. In the paper so often referred to the author says: 'From these and other considerations I resolved that if opportunity offered I would amputate the uterine mass and disregard the uterine canal. If with a clean vagina it maintained a free communication with any cavity or collection of fluid which might form in the stump, then it would act as a drain.' Per contra, let us look at Leopold's statistics. The pedicle was left intraperitoneal in twenty-two cases with five deaths, and these deaths were all due to septic peritonitis through the cervical canal.

"Leopold's conclusions of the whole matter are worthy of consideration by all those with ultra opinions on the absolute safety of the intraperitoneal method. He says: 'When only a small opening has been made into the uterine cavity, the uterine artery should be ligated on both sides, the exposed mucosa cut out in funnel shape, the opening closed by sutures according to Schröder's method, and the peritoneum sutured together so as to cover the wound. Then the stump may be safely dropped into the peritoneal cavity.'

"This suggestion covers the enucleation of fibroids from the uterine wall. If, however, the uterine cavity is widely opened, or the tissue of the stump soft and friable, brittle or cavernous, or if the condition of the patient is so poor that we do not care to tax the absorptive power of the peritoneum, it is far safer, and even necessary, to leave the pedicle extraperitoneal."

What a remarkable commentary is the verdict of this remarkably successful surgeon of wide experience upon the dictum of a class of operators far inferior to him from an operative and analytical standpoint!

He freely points out the danger in a class of cases which, to listen to and judge by their discussion, only exists in the minds of those who do not wish to abandon the old for the new method.

From all these points, as I shall endeavor to show by a diagrammatic demonstration of the method of forming a pedicle, it must remain unquestionable, in the light of my own experience and results, that the extraperitoneal method is at once the safer and simpler and most general in its application, and therefore the one to be preferred. As to the accidents that are commonly classed under a head peculiar to it, these, I trust, will be mentioned in the discussion. Suffice here to say that the

neud should never slip, that the bowel should never be included in it, and that by care the bladder and ureters ought never to be involved.

These calamities have each occurred to me once, and I am free to condemn myself as responsible for them, and do not lay it to the method.

Finally, I am convinced that if it is concluded for any reason that the neud cannot be complete, extirpation is likely to be the safest resort and therefore the one to be selected. This, however, opens up a field of discussion too wide for a single paper, and I leave the matter with the mere suggestion.

Results and statistics are wholly in favor of the extra- and supraperitoneal and clean extirpation. The latter procedure I do not oppose. I have practised it successfully, but the risks are greater than in the old and established procedure.

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SYMPHYSIOTOMY.[1]

BY

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The distinguished honor which the President of the Obstetrical Section of the Pan-American Medical Congress has conferred upon me by choosing me to address you on the point that, at the present moment, more than any other occupies the minds of the greatest obstetricians all over the world, cannot be due to my personal experience with the operation of symphysiotomy, since I have only performed it once,[2] but must be attributed to an indulgent appreciation of my studies, experiments, and writings on the subject.

I shall not lose any of the brief time allotted to each paper by entering into the history of the operation, further than to remind

[1] Read before the Section on Obstetrics of the Pan-American Congress held in Washington, D. C., September, 1893.

[2] A report of this case, with a study of the operation in general, is found in the American Journal of Medical Sciences, March and April, 1893.

you that it was proposed in 1768, and performed for the first time in 1777 by the Frenchman Jean René Sigault; kept alive in Italy, especially through the efforts of Prof. Morisani, of Naples; and spread over the whole world by being adopted by Prof. Pinard, of Paris, in 1892. Since then it has been performed so many times that it is not possible any longer to keep track of all the operations, their number probably being not far from two hundred. Of these, as far as known, 26 have been performed in the United States; 4 women have died (15.39 per cent), 4 children were still-born, 4 died within 3 days (30.77 per cent).[1]

Space Gained.—If the symphysis pubis is cut on the cadaver lying with outstretched legs, the ends of the pubic bones separate only about half an inch (1 centimetre); but if we bend the lower extremities at the hip and the knee, this distance is increased to 1¼ or 1½ inches (3 to 4 centimetres), and by pulling on the iliac bones it can easily be extended to 2¾ inches (7 centimetres) without injury to the sacro-iliac joints, which, like the symphysis pubis itself, become larger and more mobile during pregnancy. If the separation is carried still further a cracking sound is heard, and rupture takes place in one or both sacro-iliac joints, the right giving way before the left.[2] This ought to be avoided; but if it happens, and no infection has taken place, the joints will heal.

By the separation of the pubic bones considerable space is gained in all directions. A gap is formed in front into which the presenting part enters. If the head presents, the eminence of the anterior parietal bone enters so much into this gap that it has the same effect as if the true conjugate became ¼ to ⅜ inch (6 to 8 millimetres) longer. The distance from the end of the pubic bone to the middle of the promontory increases, at the maximum safe distance between the pubic bones of 2¾ inches (7 centimetres), more than ½ inch (14 millimetres). The transverse and oblique diameters, and every line drawn from the promontory to a point on the ilio-pectineal line in front of the transverse diameter, increase from one-quarter to one-half of the distance between the ends of the pubic bones, which, at the safe distance of 2¾ inches (7 centimetres), makes about from ¾ to 1½ inches (17 to 35 millimetres).

[1] Letter from Dr. Robert P. Harris, of Philadelphia, September 2d, 1893.

[2] Döderlein, Centralbl. f. Gynäk., 1893, vol. xvii., No. 22, p. 499.

This great gain in space from side to side makes the operation particularly valuable in places where, as in New York and Boston, the most common form of narrow pelvis is the generally contracted, while the flat pelvis is of rare occurrence.

Besides the gain in space obtained on the same level, the ends of the broken ring can be moved up and down perpendicularly, which may offer an additional help during the delivery of the child.

Limits and Indications.—If we have to deal with a child of normal dimensions we can easily calculate what degree of narrowness can be overcome by means of symphysiotomy. The biparietal diameter of the head being 3¾ inches (95 millimetres), ¼ inch (6 to 8 millimetres) entering in the gap between the pubic bones, and the distance from the end of the pubic bones to the promontory being increased ½ inch (14 millimetres), ¾ inch (20 to 22 millimetres) is gained in the length of the true conjugate. Taking, furthermore, into consideration the compressibility of the head, which is estimated at ¼ inch (6 to 7 millimetres), we find that at a conjugate of at least 3 inches (75 millimetres) we may expect an easy and safe delivery, and that the operation may be performed, although with difficulty, with a true conjugate measuring only 2¾ inches (7 centimetres). If the child is small we may even venture below this limit, Leopold having operated successfully with a conjugate of 6 centimetres (2⅜ inches).[1]

As to the upper limit for symphysiotomy, it ought, in a flat pelvis, to be placed at a true conjugate of 3½ inches (9 centimetres), above which forceps or version offers the proper means of delivery. If the pelvis is generally contracted I think the limit must be extended to 4 inches (10 centimetres).

Before symphysiotomy can intelligently be resorted to it must be preceded by accurate pelvimetry; and by flexing the lower extremities in hip and knee joint, and abducting the thighs, the accoucheur must satisfy himself that the mobility of the sacro-iliac joints is unimpaired. Furthermore, the cervix must be dilated or dilatable.

Symphysiotomy may render good service under other circumstances than a narrow pelvis. It has been used in impacted occipito-posterior position,[2] in a case of pelvic tumor,[3] and to

[1] Leopold, Centralbl. f. Gynäk., 1893, No. 23, p. 547.
[2] R. A. Murray. [3] Lepage.

deliver a torn-off head in a case of tetanus uteri.[1] It has also been used after the death of the child instead of embryotomy in a case of great contraction,[2] and in a case in which extraction proved impossible after craniotomy.[3] It has been recommended for mento-posterior face presentations in which the chin cannot be rotated forward.

Modus Operandi.—A point of great practical importance is to decide on the best way of operating. At present two methods are used.

Morisani makes an incision in the median line 1¼ inches (3 centimetres) long and ending ½ to ⅝ inch (1 to 2 centimetres) above the symphysis. Next he makes small transverse incisions into the pyramidalis muscles on both sides, so as to gain room for the introduction of the left index finger behind the symphysis, down to the lower end of it. Upon the finger he slides a strong sickle-shaped knife (Galbiati's falcetta), and cuts the subpubic ligament and the symphysis from below upward and from behind forward.

The open method was the original one of Sigault, has been reinstated by Pinard, and has been used by myself and most modern operators. A longitudinal incision is made in front of the symphysis, and extended sufficiently above to have easy access to the latter, and below to the root of the clitoris, or deviating to the left, while the urethra is carried with a metal catheter over to the right into the vulva, between the labium majus and minus. My own incision was of the latter kind and measured four inches in length, the patient being a stout woman with a thick layer of adipose tissue on the mons Veneris.

Each of these methods has its advantages and drawbacks. The subcutaneous method recommends itself by its great simplicity, it gives, in most cases, rise to much less hemorrhage, and the wound can be kept perfectly aseptic. On the other hand, if there is hemorrhage at the bottom of this deep wound, it can only be treated with tamponade, which, although rarely, occasionally has proved insufficient. The open method allows the operator to cut in the way he finds it most easy, and the symphysis being much broader in front than behind, and having a well-marked notch at the upper end, it is often preferable to cut

[1] Friedrich Schwarz, Centralbl. f. Gynäk., 1893, vol. xvii., No. 5, p. 84.
[2] Queirel, Centralbl. f. Gynäk., 1893, No. 24, p. 576.
[3] Beugnies, ibid.

from the front backward and from above downward. As hemorrhage is especially likely to occur at the lower end, it is even an advantage to cut this part last. I cut from above and behind downward and forward with a common concave bistoury. The open method has, furthermore, the advantage that the operator can see where the blood comes from and can carry ligatures with curved needles around vessels or oozing tissues. But, on the other hand, it has the drawback, if the incision is long, that lochial discharge bathes the lower end of the wound and causes fever. Thus Zweifel, operating in a hospital, with strictest antisepsis, had only 3 cases in 14 that were free from fever, and often the temperature ran very high up,[1] as it did in mine. If the soft parts are injured the open method may become necessary in order to repair them. If the symphysis is ossified and must be severed with a chain saw, as has happened several times, I think the open method also becomes necessary in order to work the saw and remove the bone dust. Taking the *pros* and the *cons* into due consideration, I think that the next time I have the opportunity of performing the operation I shall try the Italian method first, and only have recourse to the French if there is uncontrollable hemorrhage, if the repairs of injuries demand it, or the symphysis cannot be cut.

Even if we cut from above, the subpubic ligament must be included in the incision, as otherwise we do not gain space enough to let the child pass, or the ligament is torn by its passage.

As a rule, hemorrhage can be checked by tamponing the wound with iodoform gauze, if at the same time we tampon the vagina so as to get counter-pressure from this side, and the application of the two sides of the wound against each other helps also much to check the bleeding. Sometimes it has, however, been necessary to tie arteries, veins, or the crura clitoridis on both sides.

Another point of interest is to decide what is to be done after cutting the symphysis and arresting hemorrhage. Morisani leaves the further progress of labor to Nature, and uses forceps if it becomes necessary. In this he has been followed by Zweifel,[2] who has waited as much as fourteen hours. If labor pains are present such expectation has undoubtedly great advantages both for mother and child. The cervix gets time to

[1] Zweifel, Centralbl. f. Gynäk., 1893, No. 22, p. 499.

[2] Zweifel, l. c.

dilate, and the natural expulsive efforts will be less likely to hurt the child than any kind of artificial delivery. But if there are no labor pains, as in my case, the woman must be delivered at once. The patient and her friends may also object to leaving her in labor pains for many hours, aggravated by pain in the wound. She would have to be anesthetized twice. In private practice it would be difficult for the operator to watch the case and be present at the right moment. Most obstetricians prefer, therefore, to deliver at once after severing the symphysis. In so doing I think we should be guided, in the choice of the method of delivery, by the rule to use version and extraction if the head is movable, and forceps if it is engaged in the pelvis. If the cervix is not sufficiently dilated, incisions in it may lead to complete retraction over the head.[1]

In regard to the *closure of the wound* there obtains great diversity in practice. Several go so far as to bore holes in the ends of the bones and unite them with silver sutures, which are removed after ten days, as otherwise they would interfere with a repetition of the operation. This appears to me an unnecessary complication of the operation. Leopold[2] recommends suturing the cartilage with buried silk sutures, which I and others have found it impossible to do because the cartilage was not thick enough to pass any sutures through it. Many unite the tendinous tissue in front of the pubic bones with such buried sutures, which I did; but I even doubt if that is necessary when proper pressure is exercised on the trochanters. The soft parts, skin, and adipose tissue should under all circumstances be united by deep and superficial silk sutures, which are left in for a week or ten days. Drainage is superfluous. In order to keep the two halves of the pelvis together nothing is better than rubber adhesive plaster. I carried three straps 2 inches (5 centimetres) wide around the trochanters, crossing them on the abdomen above the wound. They were left on for three weeks and caused only slight excoriations, while they gave no pain, kept the bones in apposition, and allowed us easily to lift the patient on the bedpan. While they are being applied, and during after-treatment, the patient should lie with outstretched legs, the knees kept together, and the feet turned inward, as this position of itself approximates the ends of the bones.

[1] Ekstein, Centralbl. f. Gynäk., 1893, No. 19, p. 443.

[2] Leopold, Centralbl. f. Gynäk., 1892, vol. xvi., No. 30.

Maternal Injuries.—Quite a number of operators, especially German, have reported considerable injury to the vagina, the urethra, and the bladder, which occurred in consequence of the tension to which the soft parts are subjected during the extraction of the child. The bladder may likewise be caught in approximating the pubic bones, if care is not taken to push it back in closing the wound. In order to avoid the injuries due to tension it is advisable, in forceps extractions, to pull well back and rather risk a tear of the perineum, or perform episiotomy, than to expose the finer organs in front. To protect the vagina with a vectis-like instrument, as proposed by H. W. Freund,[1] will hardly be practicable. Even to place the hand in the gap between the bones, as recommended by Schauta,[2] seems to me to be more likely to increase the tension than to lessen it. The chief thing is to extract very slowly and in the right direction.

If such injuries occur they should be repaired immediately with silk or catgut sutures. If there is a tear in the bladder it should be closed with continuous catgut tier sutures, one applied to the mucous membrane, the other to the muscular coat and the peritoneum.

If a vesico-vaginal fistula appears later, it heals, as a rule, spontaneously, and if it does not it can be closed by operation.

Prognosis.—Varnier[3] has in 124 modern operations found a maternal mortality of 9 per cent, but in by far most cases death is not attributable to the operation. Properly performed, and within the proper limits, I think the prognosis for the mother is very good, not only as to life, but also complete restitution. The gait becomes as perfect as ever. Pinard has not lost a case in 18 operations, nor Zweifel in 14 operations. In Italy there have, from 1886 to 1893, been 48 operations with only 2 deaths.[4]

For the child the prognosis is more serious. Varnier, in the above-mentioned list, found an infantile mortality of 22.7 per cent. Very many are born asphyctic and are not always revived. Some have had their cranium fractured during extraction with forceps or hand. This great mortality can doubtless be much diminished if we desist from all other attempts at delivery in cases in which symphysiotomy is indicated. It seems

[1] H. W. Freund, Centralbl. f. Gynäk., 1893, No. 23, p. 521.
[2] Schauta, Centralbl. f. Gynäk., 1893, vol. xvii., p. 482.
[3] Varnier, Journal of the Medical Sciences, July, 1893, p. 112.
[4] Private communication from Dr. Robert P. Harris, June 30th, 1893.

to me we expose both mother and child to unnecessary danger by trying to deliver with high forceps before performing symphysiotomy. The child may also be protected by having the iliac bones of the mother separated by assistants during extraction, instead of using the child itself as a wedge to expand the pelvis. All means of resuscitation must be kept in readiness and applied to the child if it is asphyctic.

The combined mortality for mother and child in Varnier's list, after deducting 5 children that were dead before the operation, is 16 per cent.

Relation to other Obstetric Operations.—Finally, we will inquire what importance the revival of symphysiotomy has, and whether it is called to change our obstetric practice and teaching. It is an operation that sometimes is so simple that a tyro can perform it, but at other times so difficult and complicated that no one should undertake it who is not qualified to perform a Cesarean section. It is, therefore, eminently an operation for experts. It may, however, be performed in private practice as well as in lying-in institutions. For the mere medical obstetrician nothing is changed by the re-introduction of symphysiotomy; but for the operative obstetrician, the gynecologist, and the general surgeon engaged in obstetric practice, the greatest changes are, in my opinion, to be made in the choice of operations by which we meet the mechanical disproportion between mother and child.

Craniotomy on the living child, or, what is still worse, expectation till the child is dead, followed by craniotomy, ought never to be thought of in any community in which it is possible to obtain the assistance of a man able to perform symphysiotomy.

Induction of premature labor is accompanied by only about one-half of the maternal mortality of symphysiotomy (namely, 5 per cent), but then it has no less than 43 per cent infantile mortality[1]—that is, a combined mortality of 24 per cent—while in symphysiotomy it is only 16 per cent. In cases in which the mother's life is to be preferred—and, as a rule, the life of a grown-up person, with the manifold ties of life, a wife, and perhaps mother of other children, ought to weigh more than that of an unborn child—induction of premature labor retains its position; but in others, in which the child's life is of particular importance, symphysiotomy is to be preferred, the infantile mor-

[1] Wyder, Archiv f. Gynäk., 1888, vol. xxxii., p. 60.

tality being only about half as large as in the other operation—22 against 43 per cent. By combining the two the limit of the induction of premature labor may be extended somewhat.

Cesarean section has a combined mortality of 16 per cent, the same as symphysiotomy, and the infantile mortality is only two-thirds as large as in the latter—6 against 9 per cent.[1] But the maternal mortality is nearly three times as large—26 against 9 per cent. With proper respect for the mother's life, there can, therefore, be no hesitation in regard to the preferability of symphysiotomy.

Symphysiotomy competes even with *Porro's operation*, since it has been successfully performed when the woman had been for many days in labor, whereas the Porro operation is accompanied by the fearful mortality of 57 per cent.

Any form of Cesarean section ought, therefore, to be confined to the cases in which the coarctation goes beyond the limits for symphysiotomy.

Even difficult forceps and version operations ought to be replaced by symphysiotomy, since these operations, when the true conjugate is less than 3½ inches (8.5 centimetres), entail much greater mortality for both mother and child, and the latter, if it survives, is apt to become epileptic or idiotic.

Symphysiotomy has already in several cases been successfully repeated on the same woman.

It is evident that if the child were unusually large the operation would be indicated even with a normal pelvis.

When great force is exercised in pulling on the forceps it sometimes happens that the symphysis is ruptured—cases that have a very good prognosis. How much more may we expect to see the woman recover if we substitute a methodical wound for the irregular tears and profound bruises resulting from forcible extraction and rupture?

In my opinion symphysiotomy is a valuable addition to our obstetrical resources, which ought to be performed frequently in maternities and in private specialist practice.

[1] Caruso, Archiv f. Gynäk., 1888, vol. xxxiii., p. 255.

THE CO-ORDINATION OF THE MUSCLES CLOSING THE URETHRA, VAGINA, AND RECTUM, AND ITS APPLICATION TO THE PRECISE DIAGNOSIS AND SURGICAL TREATMENT OF INJURIES TO THE PELVIC FLOOR.[1]

BY

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THAT the perineum completes the outer layer of pelvic supports, that it perfects the valvular closure of the vaginal opening, that it performs an important function in copulation and conception, are sufficient reasons for its restoration after rupture.

The condition of the muscles supporting the pelvic openings may be determined in a precise and positive manner by the application of the physiological principle that when the sphincter ani is made to contract voluntarily, the entire levator ani, as well as the perineal muscles proper, contract at the same time, and can therefore at all times be influenced by the control of the sphincter ani.

To ascertain what muscle or muscles of the perineum are torn, place the patient in the dorsal position with the perineum exposed. If now the patient alternately contracts and relaxes the sphincter ani, all the other muscles involved contracting and relaxing, as before stated, at the same instant, it will be immediately apparent, by touching the normal positions of the various muscles, which ones contract throughout their full extent and are therefore intact, and, as positively, those that are torn, by the total or partial loss of contractile hardening at the point of rupture. Indeed, the exact site of injury may often be made out by sight alone, the sound side drawing up, while the tissues of the injured side are carried toward the uninjured side, instead of counteracting the effect of the latter as they normally should.

It will be immediately seen on trial that this affords a positive means of determining the exact condition of each individual

[1] Read before the Section on Gynecology and Abdominal Surgery, Pan-American Medical Congress.

muscle. Instead of the indefiniteness which has given rise to so many methods of operation, we have an exactness in demonstration on which can be founded an equally exact surgery.

To explain more in detail: With the patient in the dorsal position, ask her to contract and then relax the sphincter ani. I have never known but one patient to fail in doing this understandingly with a very little explanation. Place a finger upon each side of the median line and just within the tuberosities of the ischium. If the left side contracts and the right does not, we know at once that the right transversus perinei is torn. With the thumb in front and the forefinger in the vagina and to the side, we in like manner determine the condition of the sphincter vaginæ. Passing the finger just within the pubic arch and to the sides of the vagina, the firm, rounded form of the pubic part of the levator ani is particularly noticeable if the contraction be good and the muscle whole. The contraction of the obturator and coccygeal parts of the levator ani can be also distinctly made out.

In regard to ruptures involving the levator ani, there has much been written that is confusing and many operations performed with this lesion as a supposed basis, when in fact it did not really exist. Without unwarrantable artificial force the coccygeal part cannot be torn during parturition, as it can be stretched only as much as the limited extension of the coccyx demands.

The obturator part passes entirely past the vagina and is attached to the very posterior line of the rectum, being loosely connected to the lateral vaginal borders. This part of the muscle is not subjected to enormous strain during the passage of the child.

If a rupture occurs through the vagina opposite this part of the levator ani, it cannot tear the muscle, as there are no fibres which pass between the rectum and the vagina, and the bones prevent excessive distention. The most that can occur is a pushing-off of the muscle from the vaginal and upper rectal border.

The pubic portion is the most interesting to the obstetrician and surgeon, as this is the part which bears the greatest strain; yet we believe, notwithstanding all that has been written, that it is seldom the seat of extensive rupture, but that if torn none of the usual operations will reach the part likely to be injured.

Having looked anxiously for this lesion in all possible cases for over two years, I have only found five in which very extensive rupture could be demonstrated. If the fibres of this part of the levator ani passed between the vagina and rectum, as usually represented, this muscle would frequently be torn. In several dissections and in over a hundred examinations in virgins and nulliparæ I have not been able to discover the fibres of this muscle extending between the vagina and rectum, nor have I in a single instance found the slightest contractile hardening which could be traced to this muscle while the perineum was grasped by the thumb in the vagina and the forefinger in the rectum, and yet the firm fibres of the contracted muscle can always in such subjects be followed from the pubic arch to the lower side of the rectum. In the five instances in which I have observed very extensive rupture of this muscle, the rectum and sphincter ani, instead of being drawn normally toward the pubic arch, were drawn a little upward and to the sound side. The patients had not the slightest power of contracting the outer third of the vagina.

The ordinary conditions are as follows: If the tear is median the levator ani is not usually injured. If (as occurs in eighty per cent of severe lacerations) the tear is upon one side —the right almost invariably—the mucosa of the sulcus, the perineal fascia, and a few of the anterior fibres of the levator are torn through with the transversus perinei; but the most important feature of the injury lies in the pushing-off of the vagina from its rather loose attachment to the levator, so that the tissues upon the median side of the tear occupy a lower plane than usual, but upon the injured side only. Scars in the mucosa are not to be relied upon as indicating the exact site of deeper injuries. Rupture of the muscle and fasciæ may take place without rupture of the mucosa, or, if a scar in the mucosa is present, it is quite likely to be at a distance or lie in another direction from the deeper tear.

Having definitely located the injury, the technique of operation is simple. Incise the mucosa and dissect down to the torn ends of the muscle. Place stitches so as to draw the ends of the muscle together. If the rupture involves only the tranversus perinei a small transverse incision will suffice. If the pubic part of the levator ani is ruptured the operation is more serious, as the incision should be in the sulcus and the dissection carried

down to the plane of the levator, in some cases as far as the posterior plane of the rectum, and the muscles exposed and drawn up with catch forceps; tendon or well-chromicized catgut should then be passed so as to get a deep and secure hold upon the muscles. It is usually necessary to dissect up the outside mucosa and fascia, so as to get as good a point as possible for the new insertion of the muscle. Should it be necessary the operation may be completed by Emmet's operation.

It will be seen from the above that in some cases Tait's flap-splitting operation will produce good results, if the dissection is carried into the muscular plane and the sutures properly placed. It also explains the rationale of the success attending the operation described by H. O. Marcy, who has also given us such perfect illustrations of the perineal structure. It also proves the absolute correctness of the Emmet operation, as far as it goes.

While the technique of the operation may undoubtedly be improved upon, we believe that an appreciation of co-ordination of the pelvic muscles must be the foundation of a correct surgery of the part.

The results, after nearly three years of operating by this method, have been certainly gratifying, the perineum not only being restored to its nulliparous form, but, what is of more importance, the control has been perfect.

21 SOUTH 10TH STREET.

PERINEO-VAGINAL RESTORATION.[1]

BY

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(With five illustrations.)

I PURPOSE presenting under the above title a paper in which are briefly considered some of the frequent injuries to the peri-

[1] Read before the Section on Gynecology and Abdominal Surgery, Pan-American Medical Congress.

neum and lower portion of the vagina in childbirth, and a surgical procedure for restoring them to an approximately normal condition.

In 1877 I read a paper before the Michigan State Medical Society in which were mentioned "some new procedures in the operation for laceration of the perineum," and on January 8th, 1879, I read a paper before the Cincinnati Obstetrical Society, which was published in THE AMERICAN JOURNAL OF OBSTETRICS for April, 1879, describing the same procedure as in the first-mentioned article, the latter being entitled "Perineorrhaphy and a Description of a New Mode of Operating." This paper advocated a new mode of submucous dissection of the tissues, or what is now designated flap-splitting.

This method of operating was favorably commented upon by the leading medical journals of the day, and the leading text books on gynecology published in this country continued for many years to sanction it. In that paper the cutting away of the flap instead of preserving it was advised. Subsequently I preserved the flap, and, believing for a time my mode of operating, as well as the preservation of the flap, was original, so stated when asked regarding it by some of my friends. But, learning that others had also described saving the flap, no claim has been made as to its originality with myself. The submucous dissection I described—or flap-splitting operation, as now designated—was made several hundreds of times by me in public clinics, as well as by many others who had adopted it, some years before the flap-splitting operation of Tait or others had become known.

However, I am not strenuous in claiming priority in the mode of operating I described so long ago, as it is of little importance for I am only one of the great multitude working in the field of gynecological surgery.

I am prompted to this historical fact as an introduction to this paper, as the surgical procedures which I set forth sixteen years ago are occasionally referred to at the present time; and a late edition of a well-known text book, that had previously commended it by means of lengthy quotations and illustrations, now dismisses it by a brief allusion as "too bloody."

Although repeatedly asked to write an additional paper, I have had other fields to cultivate, and what seemed more important in surgical matters to engross my time and attention; but of

late there seems to have been a revival of interest in plastic gynecological surgery.

Description.—The operation I make to-day, and which is described in this brief paper, is, I believe, a great improvement on my former method. It would hardly be possible for one to make hundreds of operations of any kind without finding a chance for some improvement either in the mechanical portion or in results obtained.

There have been many surgical devices brought to the notice of the medical public under the general title of perineorrhaphy, but the merits or demerits of other operations than the one here described will not be considered.

It is not my purpose to discuss laceration of the perineum or the necessity for repair in detail. It is well known to every careful observer that rather extensive laceration of the perineum and vaginal walls occurs in childbirth from which no bad results follow. Again, it is equally well known that many discomforts and divers reflex symptoms often ensue from lacerations that at the time of their occurrence seem too insignificant to demand a passing thought or even a single suture.

The immediate or primary operation will not be discussed. It is to the consideration of secondary operations alone that your attention is called. I will state, as a general proposition, that operations are not demanded because of laceration *per se*, but when there are unmistakable discomforts that can be plainly traced to them, and health and comfort can only be recovered by restoring the torn parts to their normal relations.

The portion of the recto-vaginal septum commonly designated the perineum supports the lower portion of the posterior vaginal wall, which in turn supports a corresponding part of the anterior vaginal wall. The lower portion of the rectum is sustained, and the proper performance of its functions aided, by the perineum as a whole, but particularly by the levator ani. Four muscles, the bulbo-cavernosus, the transversus perinei, the anterior portion of the levator ani, and the sphincter ani, are united in the perineum; and it is the severance of these from their fellows on the opposite side, together with the separation of the perineal fascia, which produces the mischief; therefore laceration of the perineum and a portion of the posterior vaginal wall, whether partial or complete, may cause a variety of conditions, such as loss of vulvar integrity and impairment of the functions

of the rectum; partial or complete incontinence of the rectum and bladder; increased and irritating secretions of the vagina and rectum, and recurring prolapse of the rectum after operation for prolapsus recti; descent of the recto-vaginal septum, or rectocele; a similar condition of the anterior vaginal wall and bladder, or cystocele.

It is now a long time since attention was called to the prominence which the levator ani muscle occupies among the others of the pelvic outlet. Nevertheless the functions and importance of this muscle have not been sufficiently considered by the majority of either writers or operators. Therefore they have not always appreciated how large a part it plays in producing the above pathological conditions.

Dr. Robert L. Dickinson,[1] in his article "Studies of the Levator Ani," has given a very full and admirable description of the relations, functions, and strength of this muscle, with illustrations and diagrams.

I have seen quite a number of patients that had been operated upon, with the result of having, to all external appearances, a perfect perineum, but with a rectocele above the line of the dissection or flap-splitting, that formed an excellent pocket for the accumulation of uterine and vaginal secretions in which the neck of the prolapsed uterus was constantly macerating. In many of the cases where only a portion of the redundancy is remedied, the only benefit seems to be to provide a better support for some form of pessary to sustain the uterus and vaginal walls.

My own observation and experience, which I presume agrees with others, is that there are, at least in a general sense, four important ends to be attained in repairing the class of injuries under consideration: 1. To restore the loss of power and function to the lower portion of the rectum and vagina. 2. To restore the normal sustaining quality of the posterior vaginal wall for the anterior vaginal wall and bladder. 3. To provide as much support for the uterus as the perineum naturally gives. 4. To cure the many distressing nervous accompaniments.

Any surgical procedure which does not obtain relief to a great degree is not, in a strict sense, successful.

A perineum may be operated upon and, as far as external appearances are concerned, be a success; but if above the point of

[1] Prize essay, AMERICAN JOURNAL OF OBSTETRICS, September, 1889.

dissection there still remains a redundancy of the vaginal walls, or the restoration is not sufficient to support the anterior vaginal wall, the operation is but partially efficient. This is true whether the uterus is held up to the health line or not. There are so many cases operating to produce uterine displacement that it is not, as a general rule, just to gauge the success of an operation by the measure of uterine support it secures. For the reason that these partial operations are often insufficient, and are not followed by the anticipated beneficial results, I have chosen to designate the surgical procedure I have been making for a number of years perineo-vaginal restoration. To accomplish the best permanent results it is essential that dissection of



FIG. 1.

the flap extend as high within the recto-vaginal septum as there are signs of slack or redundancy of the posterior wall.

My mode of procedure is as follows: I first nick with the scissors each labium to mark either termination of the anterior margin of the flap, and then, having introduced two fingers into the rectum, and assistants making the parts taut, I insert the sharp-pointed scissors near the juncture of the integument and mucous membrane in the median line, or sometimes on one of the nicked lips, and proceed to dissect a flap up the septum as far as redundancy of the walls can be observed (Fig. 1).

It is important, for the sake of making a more rapid and neat operation, that the dissection be made in its entirety without withdrawing the scissors. When I first described my mode of

operating in 1877 my friend the late Dr. Albert H. Smith devised a knife to take the place of scissors, and subsequently I caused a knife to be made larger and more flexible than his (Fig. 2, *d*).

The scissors which I have used for the past six years are slightly curved, with blades completely overlapping each other, and both inner and outer edges ground equally sharp. I have found this form of blade is less liable to become entangled in submucous dissections than the ordinary-shaped blade (see Fig. 2).

These scissors can be used alternately in their proper capacity or with blades closed as a knife to dissect the flap more perfectly, as their sharpened outer edges and points render this an easy task; and there is a great advantage in their use in cases

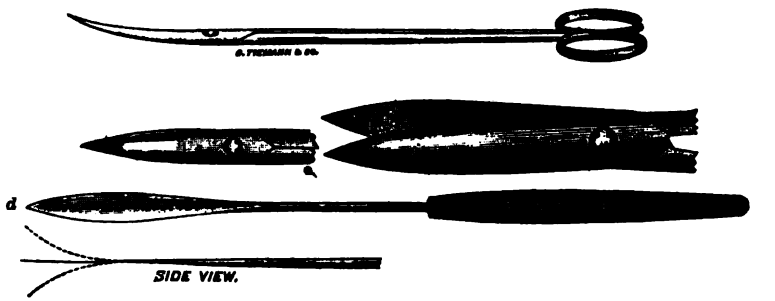


FIG. 2.

where there is tendency to bleed, as there is less hemorrhage than with an ordinary knife.

One objection recently made to this operation is that it is bloody, and sometimes one or more arteries have to be tied.

In the event of arteries being severed, compression with hot sponge or twisting will usually suffice; but if ligation is required, catgut is preferable if the ligatures are buried.

In many hundreds of operations I have not been compelled to ligate vessels, all told, more than six times.

The next important step in the operation, after the dissection of the flap, is the insertion and adjustment of the sutures.

No better results have ever been obtained than by silver sutures, but on account of their stiffness they cause more pain; therefore I substitute the silkworm gut, which possesses the principal advantages of silver wire and is not so unyielding. Kangaroo tendon is also a safe and useful suture.

The needles are a straight, flat, non-cutting needle about two inches in length, and a slightly curved Peaslee needle. The latter is provided with a carrying thread of No. 4 or 5 braided silk eighteen inches long. The former is used only for the short and superficial sutures, which are threaded directly into the needle.

In the majority of methods of operating for incomplete laceration, the first and frequently the second sutures are shorter and of far less importance than the third or fourth and fifth, as the case may be. But in my operation matters are reversed, for the first two sutures are the longest and most important.



FIG. 3.

Indeed, for want of a better term I often call them the *parent stitches* (Fig. 4, page 646).

The first assistant lifts up the flap by means of a tenaculum hooked into the edge at the centre (Fig. 3). Introducing two fingers of the left hand into the rectum to guard against wounding it, I start the needle at the distance of one-third to one-half of an inch back from the denuded surface, and, turning the point well toward the left buttock, and the handle correspondingly as far in the direction of the right buttock, I push it rather deeply into the tissue of the anterior ischio-rectal space, then upward and finally inward along the recto-vaginal wall until it has been carried just above the highest point of dissection in the centre, at which location, or as near to it as possible, the needle point is brought out. The needle is then introduced

in the same manner in the opposite side, the upper end of the suture threaded into the loop, and the other half of the stitch carried to place.

For the second stitch the needle is started in about a third of an inch above the first, and its point directed at first outward in the same manner as in the introduction of the first suture. Not quite so much lateral tissue is taken up this time; that is, the needle does not make quite so wide a side sweep for the second suture, but passes more directly up along the recto-vaginal septum, and, when it has reached the upper third of its course, crosses the first suture and comes out on the vaginal mucous membrane about one-half or two-thirds of an inch above the central highest point of dissection. After drawing the first half of the suture into place the needle is introduced in the same manner on the opposite side for the second half of this stitch.

For the third stitch, a third of an inch above the second, the needle passes along the denuded surface till it reaches the line of junction of the septum and the flap, when it enters the latter at about its upper fourth, burrows across to the opposite side and down the denuded surface to the outside.

This stitch can sometimes be introduced in one continuous circuit, in other cases one half at a time.

The fourth and fifth stitches are buried under the denuded surface as far up as the junction of the septum and flap, where they pass under the flap, without burrowing in it, to the opposite side. With each of these sutures it is usually more convenient, although not necessary, to put in one half and then introduce the needle on the opposite side in the same manner for the other half.

When the sutures are drawn up *en masse* the flap will emerge more or less from the introitus, and will frequently have the appearance of being much too long; the operator will consequently be tempted to pare off a quarter of an inch or more from the anterior edge, but this should not be done except in rare cases of great redundancy. This slack is disposed of by the gradual retraction of the flap during the process of healing and settling into normal relations. The sutures are now loosened again and the sixth stitch introduced, which is designed to purse up the anterior side of the flap and also bring together the last of the denuded surface. For this pur-

pose the straight, thin needle previously mentioned is used. The needle is passed under the portion of denuded surface contiguous to the edge of the flap, and thence into and through the latter to the opposite side.

Care is required, in adjusting the first two long sutures, not to draw them too tightly, otherwise they will cut in a little, and, owing to their including so much tissue adjacent to the rectum, will be painful. The third, fourth, and fifth sutures can be drawn more tightly. The sixth, again, should be but moderately tight, as the pursed-up edge of the flap will not bear much restriction. Usually two or three superficial sutures of fine silk, horsehair, or small silkworm gut will be required to coapt any raw edges turned out by the puckering-up of the flap. These last are not absolutely essential, but they give a neat



FIG. 4.

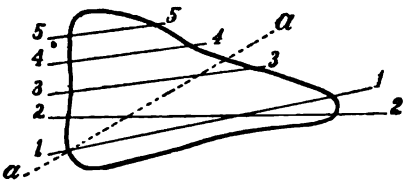


FIG. 5.

appearance to the operation, as well as dispose of surfaces for absorption or granulation. If silver wire has been used, the ends may be massed together and inserted into half an inch of small rubber tubing to prevent them from pricking the patient.

In any surgical work, but especially in the plastic operations of gynecology, it is extremely convenient and helpful to an operator if he is ambidextrous. However, but few possess this accomplishment to a full degree, and it is not really a *sine qua non* to skilful operating. Many expert operators do not.

In case there seems to be a tendency to persistent hemorrhage beneath the flap, I place as a compression stitch a strong silk suture, by means of a Peaslee needle, outside of the adjusted sutures and over the flap, which I retain for about twenty-four hours and then remove (Fig. 5, *a*).

In this operation, or almost any other for perineorrhaphy, the

long stitch or stitches which pass from the outside up to the highest point of dissection in the vagina should always be put in one half at a time. If the dissection is made even approximately as high as it should be, a slightly curved needle cannot make the whole circuit at once, except in a patient with lax tissues and a broad space between the tubera ischiorum. But even when it can be done it is accomplished at the expense of considerable strain on the parts operated upon and on the whole vaginal column.

I have constantly mentioned six as the number of sutures employed, but only because that is the number most commonly required. Occasionally five are sufficient, and sometimes seven or eight are needed.

As there are no exposed raw surfaces either externally or internally, but little dressing of any kind, and but few vaginal douches, are demanded. Three or four are the usual number: one at the end of thirty-six hours, another on the fourth or fifth day, and another on the morning of the day the stitches are removed, usually the seventh. The external parts, on the other hand, require about the same attention as in other perineal operations. Night and morning, and each time after urinating, the soft parts adjacent to the line of union, and also the buttocks, are carefully separated and the wound and the surrounding parts gently irrigated with sterilized water or a 1:6000 solution of bichloride.

The bowels should be thoroughly evacuated, about the sixth day after the operation, by a laxative, a saline and an oil enema, and the sutures removed about the seventh day. To insure solidity of the newly constructed parts I require the patient to lie in bed from two to three weeks.

The surgical procedure which I have described in this paper cannot commend itself on account of the consummate ease or rapidity with which it can be made. It is not as easily or quickly done as ordinary perineorrhaphy, nor even as the flap-splitting operation of which so much has been written of late. But after essaying different operations, from Baker Brown's to many of the present day, I have settled upon the method I have here briefly outlined as the best one I can make for the great majority of cases that present themselves to me for treatment.

In conclusion, there are a few points to which I wish to direct attention.

1. Any single mode of operating is not adapted to every case of laceration of the perineum.

2. All other qualifications being equal, that surgeon will be the most successful in this class of operations who, instead of following hard-and-fast rules, possesses a mechanical skill which he can adapt to the peculiarities of each individual case.

3. The subsequent comfort of patients is not facilitated by superabundance of cicatricial tissue within the vagina; therefore the anterior wall, instead of being subjected to any surgical procedure for redundancy, should be sustained by a restoration of the normal posterior wall.

4. The surgical operation here advocated has for its object a restoration of the torn posterior vaginal wall and perineum to their normal condition and functions, whereby there is afforded (*a*) support for the uterus to the full extent provided for in the vaginal walls; (*b*) support for the anterior vaginal wall and bladder; (*c*) support for the lower end of the rectum.

RECENT SURGICAL ADVANCES AND THEIR RELATION TO CONSERVATIVE OBSTETRICS.[1]

BY

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THE term "conservative obstetrics" may be interpreted in two ways. To those who believe that delivery is best effected by Nature alone it means the withholding of active procedures, in that they involve a possible interference with the natural process. On the other hand, to those who rely upon the strict observation of indications to determine when Nature calls for aid, it means the intelligent choice of artificial means to delivery at the proper time.

Obviously the first interpretation is wrong, and, if it had been held as the standard of practice by the best obstetricians of the earlier schools, we should not have had the science of

[1] Read before the Section on Obstetrics, Pan-American Medical Congress.

obstetrics enriched by the resources of the present day, surgical or otherwise. As to the second interpretation, it is the object of this paper to discuss the degree to which the introduction of modern surgical methods has influenced the conservative treatment in obstetrics. I shall, with this end in view, consider the surgical treatment of ectopic gestation, abortion, septicemia, and dystocia from contracted pelvis.

Ectopic Gestation.—At first sight it seems inappropriate to consider the surgical treatment of this affection as having any bearing upon surgical obstetrics. Properly the subject belongs to the province of surgery; the early confusion of the signs of tubal pregnancy with other pelvic lesions, and the similarity in treatment, placed this affection naturally within the limits of gynecology. But, outside of the surgical treatment of ectopic gestation as an obstetrical complication—that is, in the later months, after the formation of the placenta—obstetrical science has been benefited by the recent surgical treatment of this condition in two directions. Surgery, in the first place, has made the pathology of the condition clear. It has also shown the frequency of its occurrence, and has demonstrated the process of the development of the ovum in its unnatural position and the liability of rupture. In the second place, it has cleared the question of diagnosis and made the early history of cases of suspected pregnancy a subject of more careful observation than formerly. The successes from the use of the knife are supplanting the more uncertain methods of treatment, such as electricity and similar unsurgical procedures (aspiration and the injection into the sac of morphia, etc.).

Obstetrically we may discuss two conditions, the result of rupture in tubal pregnancy. First, when the sac ruptures into the peritoneum and the placenta continues its development, either by transplantation or marginal growth, and pregnancy advances to term. Under these circumstances we are confronted with the danger to the child and the danger to the mother from secondary rupture of the sac with the escape of liquor amnii into the peritoneal cavity. The treatment is abdominal section with drainage and packing of the wound, the remnants of the sac being removed by irrigation. The results at this stage are unsatisfactory. Sutton has collected six cases where the operation was performed between the seventh and ninth months of gestation, the child being alive. The mothers recovered in

three cases. In two cases the child died within a few hours after delivery; in the other four cases one child lived six months, two children lived eleven months, and one child lived to maturity. Secondly, in those cases where extraperitoneal rupture has occurred we may have pregnancy advancing to term. The fetus, however, is apt to die during the early months of gestation, or, if it survive, it is apt to undergo transformation into adipocere or lithopedion. In any case removal at or before term, depending upon the time at which the diagnosis is clear, is indicated. The abdominal method is to be preferred to the vaginal incision.

To illustrate the progress due to surgery in the treatment of ectopic gestation we may quote Ross, who alludes to the statistics given by Parry in comparing the results of primary operation with those when these cases are left to Nature. Parry found the mean mortality for primary and secondary operations combined fifty-two per cent. The mortality of the cases left to Nature was also fifty-two per cent. The comparison between the results of treatment in the period of undeveloped surgery and the results of to-day is striking.

Abortion.—In no field of obstetrics has there been such a revolution in treatment as in abortion. The profession, however, are not at one as to the best form of treatment, and are divided according to their advocacy of the following methods: The expectant form, which we may consider as the teaching of the conservative school, and in which instrumental interference is decried; the radical form, in which the uterus is emptied of all traces of its contents, irrespective of symptoms of retention, and in which the curette plays the most important part; the modified radical treatment, in which the cavity of the uterus is invaded when symptoms of local infection or bleeding determine active interference, either the curette or the finger being used to remove retained decidual tissue. Surgery has been responsible for the development of the radical form through the light which it has thrown upon pelvic pathology. Cases which have come to abdominal section, either immediately after the abortion or after the development of the later effects, have shown the danger of neglect in early management. Under the earlier form of treatment, as soon as the bleeding has ceased and the local symptoms have disappeared, the patient has been dismissed and the later observation of the case neglected. In-

volution in such a case has possibly been imperfect, and improper circulation from the uterine engorgement which is present has reduced the normal power of resistance of the endometrium to pathogenic organisms. As a consequence some placental débris or newly formed thrombus has become infected; this local infection extends, either by the lymphatics or by continuity, from the endometrium to the mucous membrane of the tube, and produces the condition which calls for the surgeon's knife. There is no doubt that before the era of abdominal surgery the connection, in many cases, between the abortion and this later condition—salpingitis, peritonitis, pelvic abscess—had been overlooked. This, however, is not equivalent to saying that the expectant treatment always results in this condition. The remarks of Dr. C. W. Earle in a recent discussion during a meeting of the Chicago Gynecological Society are pertinent in this connection. He says: "The question whether, in every case where a small particle of membrane or a small piece of placenta is left, it is best to go into the uterus with the finger or something else and clear it out, I believe not. It is pretty safe in the majority of cases, if no hemorrhage is present and everybody concerned is careful, to leave very small particles rather than subject the woman to another danger of infection by introducing the hand. I remember once taking away some membranes, perhaps four or five inches in length, days after confinement, that were perfectly white and absolutely without odor. I believe that if a careless obstetrician had introduced his finger or an instrument into the uterine cavity for these membranes he might have infected that woman."

This, however, is an optimistic view, and, if we have learned anything from our surgical training, it is to dread the presence of such a source of infection as retained membranes and placental tissue offer. We are not, on the other hand, committed to the radical treatment, by which, as a prophylactic measure, we are called upon to curette the uterus as a routine treatment, irrespective of hemorrhage or symptoms of retention. Nor are we always called upon to use the curette to remove retained decidua, either immediately after abortion or in the event of the appearance of symptoms of local infection, as advocated by most advanced teachers. In the first instance the uterus can be cleaned by the finger as a curette, and afterward irrigated if necessary; and in the second instance the infecting mass

can be diagnosticated by the introduction of the finger, and removed manually, the endometrium afterward being disinfected by the intra-uterine douche. The curette is to be reserved for those cases in which the process is one of acute infection of the endometrium, where digital curetting with irrigation has failed to reduce the temperature. The reason for this is that the curette is apt to dislodge thrombi and penetrate the mucosa, opening up a new channel of absorption of infected material. Good surgery, which means absolute antisepsis, has taught us, further, that tamponing in cases of hemorrhage from abortion is a temporizing measure fraught with great dangers of infection, and that where we have bleeding we are to empty the uterus as speedily as possible. Digital dilatation and extraction of the ovum and its remains are to be accomplished, either the finger or the sharp curette being used for the latter purpose.

Septicemia.—In the treatment of septic endometritis and peritonitis we meet with the most marked change of ideas. The strongest advocate of the surgical treatment of this condition is Pryor, who recommends curettement and packing of the uterine cavity for beginning septicemia, basing his treatment upon an incontrovertible theory of the pathology of the affection. He states that "innumerable clinical as well as other facts show us that the lymph channels are the most usual, most persistent, and most serious carriers of this form of infection." Concluding from this that septic infection occurs by means of the lymphatics draining the infected endometrium, the seat beyond dispute, as he correctly argues, of beginning puerperal infection, he recommends the use of the sharp curette as soon as the diagnosis of beginning infection is established, stating, in connection with the use of the curette, that "its range of application is greater than that of any other instrument used in gynecology."

In the heat of enthusiasm laparatomy at one time was the method *par excellence* of approaching and draining an infected peritoneum, yet Pryor writes: "I have almost come to the conclusion that when you cannot check puerperal sepsis by irrigation, curetting, and antiseptic dressings, the case is beyond immediate surgical relief. By the latter expression I mean the ether, operation, etc. (in laparatomy) will destroy what little chance for life remains, and that it is better to let the woman alone. But if I did a section I would most certainly ablate the

whole organ. Simple removal of the tubes and ovaries I deem worse than useless." On the other hand, we have the previous phases through which the subject of treatment has passed occurring in quick enough succession. Martineau wrote in 1884: "Refrain from all manipulations, all active interference, as long as adeno-lymphitis exists," while Polk writes: "For the present, then, until we can improve our methods, I would suggest, in the event of the failure of intra-uterine drainage in these cases, an application of the open method of drainage (by laparatomy) to the surroundings of the uterus as an additional procedure." The choice as to which of these surgical procedures should be adopted—curetting with drainage, or abdominal section—depends upon the existence of symptoms of a local peritonitis or those of an acute infection occurring from the endometrium. In the first instance we have an accumulation of pus, either an abscess or a pre-existing pyosalpinx, requiring drainage by abdominal incision; in the second we have an infected endometrium with lymphatic absorption, requiring curetting. If we are, therefore, left to choose between curetting with drainage from the endometrium, and laparatomy with external drainage, we are required to make at an early stage an absolute diagnosis of the condition, our choice of treatment being based upon the character of the infection. On one hand, the absorption is usually so rapid and the development of symptoms so acute that to wait for the detection of a localized accumulation of pus before active treatment is instituted means death for the patient. On the other hand, the use of the curette for initial symptoms is dangerous, and for the following reasons: first, the risk of perforation—although this is not of serious consideration in the earliest stage of involution, and when the instrument is used with ordinary care; second, the risk of the introduction of septic material from without; third, the separation of thrombi at the placental site and the opening of fresh channels of infection.

The curette is recommended when the endometrium is the seat of an acute septic process and the peritonitic and tubal involvement is recent and acute. The question is whether, in such cases, after the development of these symptoms, the infection along the course of the thrombi and the lymphatics is not already too far advanced to be reached by this means of treatment. Are we then to abstain from every form of local treatment be-

cause our efforts may be ill-timed? Hardly this; but we are to resort to methods bearing with them less risk and which show statistically better results. To surgical advances in this field of the subject we are indebted for special accurate studies in pathology which have thrown light upon the manner of infection and the character of the infecting elements. We also owe the establishment of asepsis in midwifery to the recent advances in surgery. In these directions the science of obstetrics has been elevated by the adoption of surgical procedures. These modifications, however, have their limit, and it is a question whether by surgical means we can surpass the careful conservative treatment of to-day, the treatment which relies on absolute prophylaxis, the judicious use of salines and calomel and stimulation. By prophylaxis we mean absolute cleanliness, abstinence from unnecessary examinations, the use of the ante- and post-partum douche—especially in cases where unusual manipulations have been necessary—irrigation and the use of iodoform internally, and the application of the ice bag applied externally in the initial stage of infection. In support of this method of treatment the following statistics from the records of the Philadelphia Lying-in Charity, from May 1st, 1891, to May 1st, 1893, are added:[1]

Number of deliveries at term	488
Number of deliveries before term	8
Average highest temperature	101°
Average duration of rise above 100⅘°.	4 days
Mortality	3

Of these cases only one required surgical treatment—laparatomy for obstruction.

Among the number of cases recorded, there were thirty-nine cases in which complications, such as mastitis, eclampsia, enteric fever, mania, etc., were accountable for the rise in temperature.

It will be noticed that the treatment followed, as noted above, has been altogether conservative; the mortality record shows one death from exhaustion in a case of twins, one from pulmonary edema, and one following laparatomy for obstruction of the bowels. A study of the records will show that the indications have been carefully observed, and that the results which have been attained are due to prompt and active treatment.

[1] The writer is indebted to Drs. G. M. Boyd and O. Hopkinson for records from their terms of service.

Symphysiotomy and Cesarean Section in Contracted Pelvis. —Within the past few years our resources in the management of difficult labor from pelvic contraction have been surprisingly increased. This has resulted not only in reducing maternal mortality, but in obviating also largely the necessity of embryotomy. This latter result has rightly served as the plea for surgical intervention. Symphysiotomy and Cesarean section have come to occupy the most conspicuous position among obstetric operations, and it is my purpose to discuss here their relative merits and indications. Primarily this will lead us to the question of choice between the various obstetrical operations, including these, and will bring us to the realization of the importance of the exact study of the indications in every case. It will be most profitable to glance first at the merits of these more important operations (I mean important in the sense of their magnitude), and then to consider their advantages over the other forms of treatment advocated by the earlier school and by the more conservative teachers of to-day. Finally we may mention the dangers of the recent operations—those connected especially with symphysiotomy—as we are at present in the stage of enthusiastic expectancy over this operation, a stage in which the dangers are apt to be forgotten or overlooked.

The question resolves itself into the choice of operation in individual cases, and its bearing upon the present discussion lies in the limitations to which the more conservative operations (induction of labor, version, application of forceps, and embryotomy) have been confined. We must admit at this time that Cesarean section and symphysiotomy have gained a recognized position, and that there are certain cases which require one or the other of these operations and preclude all other possibilities of treatment. What are these cases? According to the statements of those qualified to give an opinion, we may say that in simple flattened pelves a conjugate diameter below two and two-fifths inches calls for Cesarean section, and that symphysiotomy is reserved for cases in which the diameter exceeds this. Hirst, however, recommends induction of labor combined with symphysiotomy in "any grade of symmetrically contracted pelvis we are likely to see in this country." Does this not, therefore, substitute for Cesarean section symphysiotomy with induction of labor in cases where the Porro operation is not indicated? If so, what advantages does this form of treatment offer over those

of Cesarean section, and what dangers does it bring with it? In this procedure we expose the patient first to the risk of infection incident to the induction of labor and to the delay and manipulation of dilating the cervix; and, secondly, to the unavoidable risk of rupturing the vagina, lacerating the subpubic soft parts, and hemorrhage from injury to the venous plexus surrounding the urethra, incident to the performance of symphysiotomy. On the other hand, Cesarean section requires no more surgical skill on the part of an operator who has any claim to the title of an obstetric surgeon, and admits of the delivery of the child without the after-application of the forceps. Both operations require special surroundings and careful selection of the time of operation; but Cesarean section demands much less time for its performance, and exposes the patient to less risk of infection. The most recent statistics furnished by Dr. Harris will be of interest here: Since the introduction into the United States of symphysiotomy "four women of the twenty-five operated upon have died and six children have been lost, three of the latter having been still-born." To quote Dr. Harris further: "Compared to the conservative Cesarean sections of the best European maternities, we find that symphysiotomy has a greater mortality, both for mothers and children, and the difference is very marked as to the latter." In order to obtain even the most favorable of the results in symphysiotomy cited above, the operator requires absolute control of the cases and the most special adaptation of the surroundings, such as can be procured only in the most carefully conducted maternities. These conditions reduce the art of obstetrics to a surgical science, and the practitioner stands toward his patient as a surgeon who waits only for the time of intervention to deliver her, instead of depending upon his skill as an obstetrician to aid the natural process of parturition. This makes diagnosis the only essential factor in the case—a position which presupposes that art in diagnosis is unerring, and leaves for the obstetrician only those cases in which the indications for surgical intervention are positively wanting. The greatest disadvantage of this teaching is to make the profession regardless of the necessity for forceps and version in cases of moderate contraction, and in those cases in which the operator has been called at an advanced stage of labor without any previous knowledge of the patient—a class of cases in which surgical interference is not to be considered—and fixes his attention upon the surgical

aspect of the subject. The importance of delicacy in manipulation, exactness of diagnosis in position and presentation, and skill in operating are thus lost sight of.

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THE PATHOLOGY AND TREATMENT OF PUERPERAL INFECTION.[1]

BY

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SPLENDID results have rewarded investigators seeking the origin and character of puerperal infection. That it was not a specific fever, but one subject to the same laws as are the various wound fevers of the body, its variations from general surgical wounds depending solely upon the anatomical arrangement, has been proven, and the application of general laws of asepsis and antisepsis to the prevention of infection has been successfully demonstrated. We cannot speak so well for the evolution of treatment where a genital wound has become infected. Recognizing the unity of law existing between puerperal and non-puerperal wounds, our logical aim should be to apply the best surgical knowledge in the treatment of "surgical" wounds to the management of puerperal wounds. We are not as near the success that is possible as we should be. This has been due to the hidden character of the uterine wounds and the consequent lack of ability to meet surgical necessities in wound treatment. Thorough removal of débris, thorough antisepsis without poisoning, thorough drainage, stimulation of anemic tissues when needed, and rest and non-exposure of the wounds—these are the conditions Nature requires in all wounds, but struggles vainly

[1] Read before the Section on Obstetrics, Pan-American Medical Congress.

to obtain in many cases of puerperal infection, yielding to the inefficiency of medication, irrigation, and external applications. It can be shown that in certain conditions of puerperal infection intra-uterine irrigation will accomplish as little as would the throwing of a stream of antiseptic fluid over the surface of a breast filled with abscesses, and the case be still amenable to local treatment. Between the vulva, vagina, cervix, endometrium, and Fallopian tube, each at times an original focus of infection, a wide difference exists, both anatomically and pathologically.

Puerperal infection, always exogenous primarily in origin, consists in the absorption of living ferments acting directly by destruction of the living tissues, or by mechanical obstruction to elimination; or indirectly by the absorption of their products, the animal alkaloids. Ernst[1] mentions some forty micro-organisms that may be concerned in producing this infection. This list ranges from the comparatively mild varieties to the malignant erysipelatous streptococcus.

We recognize as elements producing a great variation in cases clinically: 1. Absorption, from a superficial abrasion, of the poisonous products of micro-organisms, simple or malignant in character. 2. The absorption superficially of the living micro-organisms themselves. 3. The entrance and retention of the micro-organisms or their alkaloids in the tissues beneath the surface, by reason of obstruction to drainage, or from anemia and weakness of the tissues. 4. The preference of some micro-organisms for certain tissues, or the equivalent, special exposure of certain tissues: for example, a deep laceration of the cervix, exposing the lymphatics; as post-partum hemorrhage, by filling the uterine sinuses with clotted blood, exposing the veins; edema developed during labor, exposing the connective tissue.

These variations make the pathology of puerperal fever very complex, but a consideration of some anatomical conditions present, though adding to the complexity, is necessary.

The placental site following parturition is an unprotected, "raw" surface. The cavernous layer and basement glandular tissue of the mucous membrane—all that remains—is about two millimetres thick, covered with a thin coagulum of blood, and its meshes, which are abundant, are filled with blood clots. The first step in the regeneration of this membrane is resorption or

[1] Hirst's "Obstetrics," vol. ii., p. 401.

throwing-off of this blood clot and detritus. In a normal case from seven to fourteen days will see this stage completed. Another week will complete the regeneration of the glandular portion of the mucous membrane. This process is delayed where the vital forces are weakened, as following a severe post-partum hemorrhage. Underneath the mucous membrane the muscular wall of the uterus is pierced by the sinuses, which, having no circular muscular fibres, are only closed when the uterine body is contracted. These sinuses may be filled with coagulated blood. The lymphatics which arise in the mucosa and pass through the muscle to communicate with the subserous network are much exposed along the inner surface of the uterus.

The following classification aims to specify the variations that may prevail in genital wounds:

1. Vulvo-vaginal infection, the wound being a simple abrasion or a laceration of the vulva or perineum, or vagina, rectum, or bladder; or a gangrenous slough which may occur in any of these structures. The infection may come from without and be either mild or erysipelatous, or from within from a labial abscess, rectal fistula, gonorrhea, or purulent leucorrhea. I should add, sutures introduced, which may create a deep-seated, confined infection.

2. Cervical infections—variations: simple abrasions, lacerations due to overdistention or to edema, gangrene from prolonged pressure or a torn lip.

3. Intra-uterine infection—variations: decomposing blood clot, retained placental tissue, placentæ succuriatæ, retained membranes, gangrenous mucous membrane, decomposing polyps and fibroids, intercellular edema and abscesses, blood clots in the uterine sinuses, phlebitis, lymphangitis, lacerations, and rupture. Sources of infection additional to those mentioned: abscesses in the Fallopian tubes, and cancer.

4. Pelvic peritonitis—variations: abscesses extraperitoneal around the uterus, abscesses within the peritoneum, the Fallopian tubes, or the ovaries, hemorrhages, and intestinal perforations.

5. General septic peritonitis.

In considering the surgical treatment of these manifold variations brevity necessitates a very partial consideration.

The great majority of puerperal infections start in the vulvo-vaginal region. If labor has been accomplished without the in-

troduction of hands or instruments within the cervix, prompt local irrigation with corrosive sublimate solution, the cleansing of any abscesses, the cauterization of sluggish ulcers, and the proper use of iodoform will check inflammation and keep it from extending into the uterus, unless of the malignant form, in the majority of cases.

Lacerations properly sutured are less likely to cause infection than if left open. Granulation is the patient's protection from infection from her own lochial discharge, which, after the third or fourth day, may cause infection if brought in contact with the genitalia of a recently delivered woman. A fissure that is not healing by first intention should be filled with iodoform powder. Deep lacerations of the cervix, in case of infection, are especially prone to cause lymphangitis that will quickly extend to the boundaries of the peritoneum. Barbour has shown how high the peritoneum rises at "full term," it being above the level of the pelvic brim. The utero-sacral ligaments reach to the first sacral vertebra. Immediate closure of severe cervical lacerations will shut off many of the torn lymphatics.

The differentiation in treatment of puerperal infection located within the uterine cavity is one of the special objects in the writing of this paper. When we consider that within this cavity there may be blood clots, varying from the size of a hazelnut to that of a cocoanut, that must decompose if not expelled by after-pains; pieces of placenta, decomposing fibroids, a gangrenous endometrium, underneath which festering mass and within its cavernous meshes thrombi and germs rest in contact, need we wonder that in many cases the imbibition of drugs becomes a farce and uterine irrigation a delusion and a snare? The rules of surgery call here, as elsewhere, for thorough removal of débris, drainage, and disinfection. Nature must be given as little to do in elimination as possible; germs must be brought to the surface and not allowed to proliferate in occlusion.

I cannot consider here the diagnosis of the conditions mentioned, further than to suggest that the character of the labor and the assistance rendered aid much in differentiation. For example, blood clots and thrombi follow great exhaustion, relaxation, and hemorrhages; sloughs result from prolonged pressure of the fetal head; lacerations and ruptures follow efforts at internal version, etc.

I believe the first step in intra-uterine treatment should be

irrigation. Always preceded by thorough cleansing of the vulva and vagina, the uterus should be washed with a solution of corrosive sublimate 1:4000 to 1:8000. The fountain syringe should not be held more than two feet above the level of the uterus. I prefer my own hard-rubber tube, which can be boiled and made to take any curve on cooling, for introducing the fluid into the uterus. A quart of freshly boiled water should follow the antiseptic, to prevent poisoning. If, following this, the septic symptoms are allayed for only a half-hour or an hour, it is fair to assume that we have not cleansed the wound.

If sepsis has already penetrated into the lymphatics—that is, not the ptomaines or animal alkaloids, but proliferating live germs—or into the veins or intermuscular connective tissue, or deep into the uterine sinuses, we may not hope to accomplish much by further intra-uterine treatment, but we are justified in determining the question before we cease efforts. We have as means of treatment gentle compression of the fundus for the expulsion of blood clots or placenta, swabbing of the cavity with cotton, scraping of the internal surface with the curette, further irrigation, and the introduction of iodoform gauze. The character of the intra-uterine surface in post-partum infection differs from that which is present following abortions, in being softer and much more fragile. The endometrium is less firmly adherent. Therefore it is seldom necessary to use a sharp curette. Moreover, the latter is dangerous, as it leaves raw surfaces, and so increases the possibility of lymphangitis, phlebitis, and the passage of thrombi into the venous circulation. A large blunt curette passed to the fundus and drawn successively over the placental site, as near as it can be located, will loosen adherent bits of placenta, the coagulum film which covers the surface, the remnants of the uterine serotina, and blood clots that are in the meshes. This débris can be gently removed with the curette, absorbent cotton probangs, and a stream of bichloride solution. The danger of forcing septic material through the tubes and causing peritonitis will be essentially avoided by not allowing the syringe to rest much above the level of the womb and by keeping the cervix well dilated. I am tempted to say that all this treatment is worse than useless unless followed by the introduction of iodoform gauze up to the fundus. There is some danger of iodoform poisoning, but the danger of death from sepsis by omitting it is very much greater.

Iodoform gauze cut in a strip from two to three inches wide, with no loose fringe, and from one and a half to two and a half yards long, packed well into the fundus, down to and through the cervix into the vagina, gathers loose débris of blood, pus, membranes, and germs in its meshes, provides uninterrupted drainage, stimulates granulation, and excites uterine contraction. It may be left *in situ* twenty-four to seventy-two hours, according to the symptoms. The medical profession owes much to Polk for introducing gauze drainage in the treatment of uterine diseases.

When, in spite of the means thus far suggested, the septicemia grows worse instead of better, what resource have we left? First let us consider the conditions we have to meet. The body of the uterus is a mass of muscle filled with pus. Abscesses may be present in the peri-uterine tissues, in the Fallopian tubes, in the ovaries, around the kidneys, or there may develop a diffuse general septic peritonitis. Before the question of abdominal section for septic peritonitis can be decided—and the only answer must be formed from experience—a more thorough classification must be recognized by operators in the different forms of peritonitis. In general diffuse septic peritonitis an invasion of the lymphatics emanating from the uterus, of the pelvic connective tissue, and, in some cases, of the veins, by living virulent micro-organisms, has preceded the peritoneal manifestations. Theoretically, to irrigate the peritoneal cavity in such a condition, where the peritoneum is surrounded without with pathogenic material, seems useless; while, on the other hand, the milder variety of septic peritonitis, in which the essential pathological condition is the presence of pent-up pockets of pus that can be opened and drained, seems to demand an operation. I have been able to collect the reports of 154 cases of celiotomy for puerperal peritonitis. Of this list 9 are distinctly stated as being cases of general diffuse septic peritonitis; 8 of these cases proved fatal. Of the remaining 145 cases 108 recovered. Three cases were reported in which no peritonitis was found. It is difficult to differentiate the variety of peritonitis at the bedside, although the virulent form is much more rapid than the mild in its development, but it would seem that an operation should be tried. It will not hasten death much in the malignant variety, may prevent it, and in the benign form is much the most rational procedure. But

few cases of abdominal hysterectomy for puerperal infection have been reported, but they are very encouraging. Several recoveries have resulted, and with such prompt improvement in the symptoms, particularly in the case of Kelly[1] and that of Smith,[2] that an operation surely seems just and conservative.

INAUGURAL ADDRESS

BEFORE THE SECTION ON OBSTETRICS OF THE FIRST PAN-AMERICAN MEDICAL CONGRESS, HELD IN WASHINGTON, SEPTEMBER 5TH, 1893.

BY

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History, with its eras and epochs, its revolutions, changes, and struggles, is the record of the events to which the opinions, the interests, and the actions of men have given birth. It is the interior of man's life, revealed in things that belong to time and this world. Our present coming together marks an important era in medicine. The assembling together of so many distinguished physicians, illustrious in their own countries, all members of the republic of science which embraces all countries, can only result in the further advancement of our science and perfection of our art.

Parturition in different races in different countries cannot so widely differ, hence the means and methods of aiding it should not be so varied. I am convinced that a meeting such as we are inaugurating to-day will be more potent in diffusing a more just and mutual appreciation of our knowledge and practice than volumes of literature; beneficial results that will be felt throughout the great republic of science. A book speaks only one language, but a society such as the Pan-American speaks all languages. I am well aware that our science is progressive and unfinished; that the doctrine of to-day is not the doctrine of to-morrow, and to-morrow it is still less likely to be dominant; and that the last words on any medical subject will not be uttered in our time. Notwithstanding all this, however, we are

[1] Goldsborough, New York Medical Journal, 1893.
[2] New York Journal of Gynecology and Obstetrics, 1892, ii., 1015.

here for the purpose of expressing collective judgment upon controverted points in our special department. Certain great principles have been grasped which seem unlikely to undergo change, but the mode of application of those principles is susceptible of infinite improvement, and each step in advance means the saving, probably, of many lives.

"Medicine," says Lord Bacon, "has been a science more professed than labored, yet more labored than advanced; the labor having been, in my judgment, rather in a circle than in progression. For I find much iteration, but small addition." Especially was this true of obstetrics until the last two decades, since which time the progress has been extraordinary, and the advancement is as gratifying as it is startling. In 1847 Semmelweiss clearly indicated the true nature of puerperal infection and pointed out the way to guard against it, but his voice was not heeded until after Lister had utilized the researches of Pasteur and become the father of antiseptic surgery. During all this time Tarnier was struggling to benefit obstetric science by the employment of antiseptics in labor, but his efforts were not appreciated until Stadtfeldt, of Copenhagen, employed them on an extensive scale in hospital practice. This marked the dawn of antiseptic midwifery and paved the way for aseptic obstetrics.

The enthusiasm with which the German school embraced the antiseptic plan soon led to abuses that were followed by serious consequences. At this time (1879) carbolic acid was the antiseptic most frequently exhibited, and during that year many deaths were reported traceable directly to its employment. Influenced by the gratifying results obtained by antiseptic methods in surgery, Schröder, Winckel, Breisky, and Gusserow inaugurated the present aseptic or prophylactic plan. They believed infection comes from without and is best guarded against by preventing the introduction of poisonous matter; hence they made their attack upon the possible carriers of germs—the obstetrician himself, his instruments, and his attendants. The dangers arising from the too free use of carbolic acid, its disagreeable odor, and the large quantity necessary were important factors in causing it to be supplanted by the bichloride of mercury, the antiseptic recommended by Tarnier in 1881, and the germicide most likely to be popular for years to come.

The obstetric forceps originally given to the profession by the French school, it seems but natural that its present perfec-

tion in the axis-traction instrument should be the result of Tarnier's genius, the most famous accoucheur to-day in France. By this instrument it is possible to terminate safely, both to mother and child, labors which formerly could only be relieved by craniotomy, symphysiotomy, or Cesarean section.

In spite of asepsis and antisepsis in obstetric practice, the Cesarean operation continued to be an almost necessarily fatal operation until within the last decade. It seemed to matter little who the operator was, or the condition of the patient operated upon, the result was the same. Barnes, in the last edition of his work on obstetric operations, published in 1886, in speaking of it says it is conservative in its design and in its ambition, but it is too often sacrificial in fact. It is resorted to with a feeling akin to despair for the fate of the mother, which is scarcely tempered with the hope of rescuing the child. It is looked upon by the great majority of obstetricians as the last desperate resource, as the most forcible example of that kind of surgery which John Hunter regarded as the reproach of surgeons, being a confession that their art was baffled. Pajot, in his preface to the French edition of the same author's work on "Diseases of Women," published in 1875, affirms that Cesarean section has cost the lives of all the unhappy, ignorant women who have undergone it in Paris since the beginning of this century, and, he adds, it is still practised. During the last ten years, chiefly through the efforts of Leopold and Sänger in Germany, Murdoch Cameron of Glasgow, and our own distinguished citizen, Dr. Robert P. Harris of Philadelphia, its technique has been so modified and improved that it has become a safe operation. The maternal mortality, in skilful hands, is not above six per cent, and the infantile mortality not more than three or four per cent. Porro, of Pavia, in 1876, in view of the frightful mortality attending Cesarean section, devised and successfully performed the operation that bears his name—*i.e.*, the removal of the uterus and appendages by amputation through the cervix after extraction of the child. The success attending this operation was so gratifying that it was approved and adopted by twenty different countries in fifteen years, displacing almost entirely the classic Cesarean. Its advocates claim for it that it gives greater security against hemorrhage, there is no uterine wound to heal, there is less risk of septicemia, and there is security against further pregnancy.

Symphysiotomy, an operation recommended by Sigault in 1768, and recently revived and performed with great success by Novi, Martini, and Morisani of Naples, was so little thought of by American obstetricians that one of our most eminent authors, in the last edition of his book on midwifery, 1890, uses the following language: "American obstetricians will find no conditions justifying its performance." In a recent article in the Philadelphia *News* by Robert P. Harris, he makes the statement that for one hundred and fifteen years after its introduction by Sigault no one ever ventured to perform it in our Western Hemisphere; and it was not until the evidences were so startling and beyond dispute that the initial step was taken in Brooklyn, on the 30th day of September, 1892, by Prof. Charles Jewett. During the past two years, however, the results following symphysiotomy have been so brilliant that in many countries it has supplanted the Cesarean and the Porro-Cesarean operation. I mention this to illustrate the rapid strides that have been made in obstetric surgery during the last lustrum, not to anticipate in any way the papers which will be read on these subjects during the session by eminent gentlemen from different parts of the Western World.

The employment of anesthetics for the relief of pain in normal labor, long practised in the United States, has in recent years become almost universal. The time has arrived when the lives of both mother and child can be saved. We now recognize that "an infant come to maturity is destined for something more important than to have its glimmering life extinguished by an accoucheur skilled in the use of a murderous perforator." Craniotomy—that revolting, murderous operation—has probably been performed for the last time on a living child. Puerperal fever, which twenty years ago hovered like a plague over the lying-in wards of great charities and menaced the lives of so many women in private practice, has almost entirely disappeared. By antiseptic treatment of the nipples, and by compression in cases of threatened mastitis, all symptoms vanish and the abscess is averted. Since the antiseptic treatment of the umbilical wound tetanus neonatorum is rarely seen. Ophthalmia neonatorum, so destructive and so frequently met with formerly, has, by the instillation into the eye of one drop of a solution of nitrate of silver 1:50, been eradicated. It would seem that we had almost reached the *ultima thule* in our special department,

that the obstetrical millennium was at hand. While this is in a great measure true, there are many evils yet to correct. While the mortality in lying-in hospitals has been so reduced that it has almost reached the vanishing point, and this in spite of the large number of abnormal and operative cases which necessarily find their way there, the results in private practice in normal cases have not been nearly so favorable. The cause of this is plain: it is due to the non-observance of prophylaxis and necessary antiseptic precautions. The dangers of the hospital are recognized and antagonized, but those which abide in the homes of ease and luxury are not so apparent and in consequence are frequently overlooked. We should insist upon it that the same scrupulous care and cleanliness be exercised in the private residence as obtain in the public charity. When this is accomplished, then will we have true prophylaxis in private practice, and the high rate of mortality which is now observed in normal labors will no longer obtain.

The consensus of opinion of the Obstetrical Section of this Congress ought to go very far in settling questions, such as how much pressure and moulding can the fetal head be subjected to without permanent damage; when is delivery by turning preferable to the forceps; the limitations and field of symphysiotomy, Cesarean section, Porro-Cesarean, and the induction of premature labor. All of these operations are recognized as safe and proper surgical procedures. Each one has its ardent admirers and loyal supporters, and each one has a field within whose limits the other operations are neither so safe nor so desirable. Symphysiotomy is an operation requiring less skill and surgical knowledge than celio-hysterotomy or celio-hysterectomy, and its range is a wide one; but even its most enthusiastic advocates will hardly claim that in every instance it is a substitute for the improved Cesarean or the Porro operation. There are cases in which the dystocia, either due to a rachitic pelvis or a tumor, or to both, is so great that pubiotomy would not enable the accoucheur to deliver a viable child. All cases can be treated with the promise of success by the Cesarean method, but it is a more perilous operation than symphysiotomy. Pelvimetry has been so thoroughly taught and insisted upon in recent times, and the pelvimeter so perfected, that even the average obstetrician can estimate with comparative accuracy pelvic diameters, and it is now possible to give approximately definite measurements to

be governed by. I believe it is now the rule with obstetricians who have had the largest experience and been the most careful observers, that, while it is possible to deliver by version or means of the forceps, with safety to the mother, where the conjugate diameter is not more than three inches, yet it is usually disastrous to the child. Therefore, in cases of flat pelvis symphysiotomy is a safe and preferable operation when the conjugate diameter is not greater than three and five-eighths inches nor below two and three-quarter inches. When it is below this the improved Cesarean is indicated, unless we have a septic uterus or a large fibroid complicating labor; in such cases the Porro operation ought to be selected.

The induction of premature labor has strong advocates and much to recommend it to popular favor; but, in view of the high infantile mortality following it, the more advanced obstetricians will hesitate to employ it. Winckel states that of children born at from seven and one-half to eight months, only thirty-three per cent are kept alive. At the Leipzig Maternity, where the incubator is most thoroughly used, there is an infant mortality of eighteen per cent, and at the Paris Maternité thirty per cent. It is also well known that the mortality of premature infants, even among the better classes, is very high during the first year of infantile life. The maternal mortality following the induction of premature labor is estimated at from five to six per cent—an estimate entirely too high in skilful hands. Recent statistics show a maternal mortality of one per cent or less in symphysiotomy, and the chances for a mature, fully developed child, delivered by this procedure, to arrive at its majority are far better than are those of the infant born six weeks or two months before its time. Extra-uterine pregnancy, one of Nature's most fatal blunders, is much more frequently diagnosed than formerly, and, in consequence, a laparatomy saves most of the unfortunate victims. Marked improvement is also to be observed during the last decade in the treatment of abortion, eclampsia, post-partum and accidental hemorrhage. Even if time would permit, it would not be right and proper in an inaugural address, which is not the subject of open discussion, to dwell at length on any one subject in our department or to make dogmatic statements.

This Section of the Congress, I trust, will be eminently a teaching Section, offering opportunities for that correction

and verification of experience which is so valuable to those whose experience is limited, upholding what is right, and exercising a wholesome influence on all obstetric surgeons. The dispelling of ignorance means the saving of life. Having that end in view, we can hardly fail to do what is right and what is best.

EXOPHTHALMIC GOÎTRE.[1]

BY

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I HAVE spent considerable time lately in searching the records of cases of exophthalmic goître, and although there is much literature on the subject and many cases reported by men in this country and abroad, yet the symptoms of all the cases of which I have read are remarkably alike. The disease is known also as Graves' disease and Basedow's disease, and there has been much controversy as to who was the first person to describe it. According to J. Wickham Legg in the St. Bartholomew Hospital Reports,[2] the first recorded case of exophthalmic goître was noticed in 1786, long before Graves' or Basedow's time. It was described by a man named Parry, who lived at Bath about the end of the last century. The case was published in Stokes' first edition of his treatise on diseases of the heart, and it is to Stokes that we owe a good part of our present knowledge of this disease.

Graves published an account of exophthalmic goître in 1835, whereas Basedow published a paper on the subject in 1840. The Germans named the disease after Basedow, and the French immediately called it after Graves. Basedow laid much stress on the exophthalmos, while Graves only mentions that incidentally. Legg concludes by saying: "If we are to search for the true founders of our knowledge of exophthalmic goître, we should look to Dublin, to Graves, to Marsh, to Stokes: not to Merseburg."

[1] Read before the Obstetrical and Gynecological Society of Washington, D. C., April 15th, 1892.

[2] London, 1882, vol. xviii.

My own personal experience with the disease in question has not been large, only three or four cases, and they were not unlike others that are reported. In one case the eye symptoms were the most important, as she had ulcers of the cornea and conjunctivitis, and thought her eye troubles were the only things the matter with her. In another case the exophthalmos and rapid heart beat were the most prominent symptoms, while the enlargement of the thyroid gland was scarcely noticeable. The other two cases that I recall had the usual symptoms equally well marked. There is one point I wish to call attention to—and until only a few days ago I had not seen it mentioned in any of the works I had read—and that is the tendency to diarrhea, which soon becomes very obstinate. Very slight indiscretion in eating will frequently cause a diarrhea that resists treatment in the most obstinate manner. One of the above cases died from diarrhea which resisted the most careful treatment.

The disease is recognized in different countries, but there are certain localities where it is more frequently seen, and, according to Engel, in the province of Styria, in Austria, the disease is endemic.

Etiology.—It is pretty well agreed by all writers on this subject that exophthalmic goître is caused by some severe shock to the nervous system, or mental worry and anxiety. Gowers says there is no immediate cause so frequent as depressing emotion, sudden terror, or prolonged distress, and that there were many cases in Alsace and Lorraine after the Franco-German war. He furthermore states that the disease is apt to occur in many members of a family, although it is not inherited; that the causes of ordinary goître seem to have very little influence in producing the exophthalmic form; that general debility and anemia are powerful predisposing causes, as are hemorrhage, exhausting discharges, childbirth, and abortion. Sometimes amenorrhea precedes it. He says that women suffer more than men, in the proportion of five to one. It may occur at any age from 2 to 60, but mainly from 20 to 30.

Hammond says there were very few men among the cases of exophthalmic goître that he has seen, and that among the exciting causes mental shock was the most powerful. Eulenberg states that the disease occurs in women oftener than in men, in the proportion of two to one.

Of five hundred and fifty-one recorded cases only twenty-six were males, or less than five per cent. Dr. Mitchell, Assistant Commissioner in Lunacy in Scotland, reports that in Millerdale, its chief focus, the women are eighty to ninety per cent.

In the *Lancet* for 1876, vol. ii., Henry Day claims the cause to be emotional, and that excitement of the nervous system, carried to a pitch far beyond what is natural or healthy, will lead to disorder of one or more parts of it. He says the disease may begin suddenly, or may have prodromata such as feelings of languor and malassimilation. There is a case recorded where all the symptoms appeared in one night. He quotes the opinions of several eminent men as to the cause of the disease: Begbie thought it depended partly on a blood condition and partly on nervous disorder. Nunely, of Leeds, thought it was due to an aneurismal state of the vessels in the cranium, and says the carotids ought to be tied; that five out of six cases of his recovered from tying the carotids. Galezowsky, Trousseau, and Meyer believe it due to a lesion of the sympathetic nerve; but other writers have made autopsies on persons who have died of the disease and there was no lesion of the sympathetic (Fournier and Ollivier).

Stokes thinks the disease is due to a special form of cardiac neurosis, which may lead to organic disease, and that the nervous excitement is possibly propagated to the arteries of the neck, as he thinks the pulsations are more than can be accounted for by the force of the heart. Laycock says it is due to a neurosis of several vaso-motor centres in the spinal cord. J. O. Fletcher thinks it is induced by sleeplessness, anxiety, etc., impaired digestion, or a condition of "hyperemia." Handfield Jones thinks that the fundamental trouble is debility, especially of the nervous system, which, by affecting the various vaso-motor nerves, gives rise to the several symptoms.[1] Thus we see that there are

[1] As an instance of the disease coming on suddenly and from exhaustion, W. W. Dawson (Cincinnati Medical Repertory) reports the case of a woman aged 29. She had three children and three miscarriages. Three years ago she miscarried at the fourth month; the next day she got out of bed and walked a mile and a half, then got on a street car and rode several miles further. Before getting home she noticed a swelling of the legs and also an enlargement of the thyroid gland. After that she did not menstruate for five months. The swelling of her legs soon disappeared, but the thyroid gland steadily increased. Amenorrhea, according to Trousseau, is almost a constant attendant on this disease. Dawson gives as causes grief, interrupted menstruation, miscarriage, nervous depression, recession of skin affections, and attacks of fever.

a good many opinions, but in the main they agree that it is a nervous disorder and produced by shock, mental depression, and long-continued anxiety.

We will now take up the symptoms. These may be enumerated at great length, but there are three that characterize the disease. These are: (1) palpitation or rapid beating of the heart; (2) enlargement of the thyroid gland; (3) protrusion of the eyes. There is a fourth symptom, which I have never noticed myself, but upon which Hammond lays great stress in the last edition of his work on nervous diseases. This symptom was first discovered by Louise Fisk Bryson, of New York, and consists in a gradual and steady decline in the extent of the expansion of the chest in forced inspiration. The prognosis of the case is somewhat determined by this symptom: the less the expansion the graver the case. The first three symptoms usually make their appearance in the order in which I have named them. The heart is rapid and irregular, and the slightest excitement or exertion will run it up to 120 or 150. The patient has palpitation and can feel the pulsations through the chest. Even when the patient is perfectly quiet the pulse is rarely below 100. According to Hammond, the increase in frequency of its beats produces increase in size of the heart, and on examination a systolic murmur is often heard, which may be arterial or ventricular; if arterial it is anemic, and if ventricular it is due to a relative insufficiency in the auriculo-ventricular valves. Meigs, of Philadelphia, reports a case,[1] in which the patient's pulse had a regular staccato beat and the carotids had the purring tremor—the "frémissement cataire" of the French. The woman had no mental disturbance of any kind except severe headaches.

The two lobes of the thyroid are usually equally affected. When they are very large there is much difficulty in swallowing from pressure on the esophagus. The gland is highly vascular, and when there is violent arterial overaction we get a thrill over it.

The exophthalmos varies. Sometimes it is so slight as not to attract attention. Again it is excessive; in such cases the lids cannot cover the eyes, and inflammation of the cornea results. In one case that I remember I used to close the lids at night, and hold them together by means of adhesive plaster, then put absorbent cotton over the eye and apply a soft bandage with

[1] Philadelphia Medical Times.

gentle pressure. There are many theories as to the cause of the protrusion of the eyes. Pepper says it is due to distention of the vessels of the post-ocular tissues, with serous infiltration and perhaps some hypertrophy of the cellulo-fatty tissues behind the globe. Hammond says it is due to vascular turgescence in the orbit, to an increased amount of the fat which this cavity normally contains, and to a fatty degeneration of the ocular muscles by which their tone is destroyed and the eyeball allowed to protrude. He adds another factor, and that is the contraction of Müller's orbito-ocular muscle, by which action the eye is thrust forward.

M. Reimoning, of Bordeaux, claims to have found a new symptom. It is a bruit de souffle which is very distinct on applying the stethoscope over the eye, much stronger on the right side than the left, extending even to the right temple. This bruit de souffle has been also found by M. Henri Gintrac, but it did not extend to the temporal region.

Another symptom, first described by Von Graefe, is the delayed descent of the upper eyelid. When a healthy person looks from above downward, the eyelid descends coincidently with the eye; but in exophthalmic goître the lid follows after an interval of time. This, according to Grainger Stewart, is not a mechanical result of exophthalmos, but depends upon irritation of the muscular fibres of Müller, which are supplied by the sympathetic. It is usually stated that the vision is not affected, but Wilmer, of this city, reported, a short time ago, the case of a woman who had the three main as well as all the concomitant symptoms, and, in addition, well-marked myopic astigmatism. The eyes were unequally pushed forward, and, although both eyes were astigmatic, the more prominent eye was much more so. This looks as if the astigmatism was due to a mere mechanical process. Hugo Engel reports three cases showing the beginning, full development, and the sequelæ of the disease: "I.—Young girl born in Philadelphia. She first noticed a beating of her heart, then a "growing of her eyes," and for six weeks she had noticed a swelling in her throat. On examining her heart the area of dulness was not increased, but there was a heaving impulse, the first sound was louder than the second, and the circulation decidedly irregular. II.—A lady, pregnant, born in Styria. She has suffered from enlargement of the throat as long as she could remember, but only four years ago she had

palpitation of the heart, and at the same time she noticed prominence of the eyes. She was married at this time. She suffered from simple goître first, then it developed into Graves' disease. She has two children, and her symptoms always increased when she was pregnant. Her heart was enlarged and the impulse could be felt over several interspaces. She suffers much from dyspnea, headache, vertigo when she stoops down, and constant buzzing in the ears. III.—Lady, 40 years of age. Healthy up to 16. Became very nervous and had severe beating of the heart, and a tumor appeared at the root of the neck. Later her eyes became prominent. Under treatment it would nearly disappear, but return. When suffering severely her menstruation would become irregular and painful. Finally she went to New York and was supposed to be cured by electricity. The prominence of the eyes disappeared, and the tumor shrank to the size of a walnut, and there was no pulsation of the carotids, but she had shortness of breath on the slightest exertion and has fainted several times. She has never been free from palpitation. Urine contains a small amount of albumin, but no casts. Has edema of the legs up to the knee, and the eyelids are puffy. Examination of heart shows dilatation; the lungs show passive congestion. First the heart hypertrophied and then dilatation followed." This case shows that the most important symptom to treat is the accelerated heart beat.

Prof. Yeo[1] reports an interesting case of a woman æt. 35, married, four children; had palpitation and pain in left side, cough, shortness of breath; no appetite; vomited frequently; tendency to diarrhea after a meal or exertion; flushed easily; perspired profusely. Always nervous, but good health till last confinement. She was then given ergot every ten minutes for four doses, and her labor only lasted one hour and a half, instead of fourteen hours as in her previous labors. Soon after the confinement she had fever, attended with sickness, purging, and delirium. It lasted three weeks, and when she was better her friends would not let her look at herself in a glass because she "looked so wild." There was marked exophthalmos on the left side and not on the right, but the goître was on the right side. After many months the right eye also became prominent, and then the hairs of the eyebrow and eyelash on the right side began to disappear. Yeo calls particular attention to the diar-

[1] British Medical Journal.

rhea, which is seldom mentioned in text books, and Pepper[1] reports the case of a young lady of nervous temperament who was in the habit of eating largely of unwholesome food, as candy. She went to a camp meeting, where she became much excited. The weather was bad, and a diarrhea set in which could not be checked. It became chronic. Soon after palpitation of the heart was noticed, also dyspnea, enlargement of the thyroid. She grew weak and lost flesh, was very nervous, and wept on slight cause. Menstruation ceased for five months. Pulse ranged from 175 to 180. The stethoscope revealed a distinct, high-pitched murmur over temporal region on each side.

Gowers mentions that the eyeballs are sometimes so pushed forward that it has been said they were dislocated and replaced with the fingers; and Graves, in speaking of the dilatation of the heart and its murmurs, mentions a case in which the sounds could be heard four feet off. He says frequently mitral endocarditis is found after death. A very important symptom is muscular tremor. This is different in different cases. Pierre Marie[2] says there may be epileptiform and more or less pronounced paralytic phenomena, even amounting to hemiplegia. To illustrate the extent of the tremor he quotes a case: A young woman, married, 19 years old, movements irregular and choreic, nystagmus. For many weeks the legs jerked so that she could hardly walk and would make irregular steps. There were crises of vomiting, constipation, and sudden diarrhea. Choreiform movements ceased after eight or nine months, only to reappear. Had frequent fits of coughing. Some months later the patient succumbed to pulmonary tuberculosis.

We will now turn to the pathology of exophthalmic goître, which is of extreme interest, possibly because it is not definitely known where the seat of the trouble is, although there are many different theories advanced. Prof. Laycock, in speaking of the morbid anatomy, says: "In some the increased vascular activity of the bronchocele is so great as to give the impression, when handled, of distended erectile tissue; but in others, of long standing, there is degeneration of its vessels and its consequences. When, however, these structural changes are found consecutive to excessive vascular action, they must be considered as consequences rather than the essentials of the disorder, and occurring under such constitutional conditions as are

[1] New York Medical Journal. [2] Archives de Neurologie.

required for these constitutional degenerations." He adds that "we may fairly conclude that the enlargement of the thyroid in exophthalmic cases is in truth primarily due to a neurosis of the blood vessels of the organ, like that of the other vessels of the thoracic and cervical region, and that the dilatations, thrills, and aneurismal murmurs are in all respects analogous to those of the aorta and carotids." He goes through a long course of reasoning to prove that there is a connection between the thyroid and cervico-dorsal region; also that there is an influence of the reproductive organs on the thyroid through the cervico-dorsal region; also an influence of the reproductive organs on the eyelids; also that the palpitations, thrills, and pulsations are due to a lesion of the oculo-spinal region, the seat of a neurosis of the whole trouble. There are many authors who claim that the disease is one of anemia, but Laycock gave facts and arguments opposed to its being of anemic origin. He says that recent researches have shown that there are two kinds of nervous exophthalmos, and due to two sources of disordered innervation: one of these local and dependent on morbid states of the Gasserian ganglion or its cerebral centre; the other more general, and a motor neurosis of the "oculo-spinal" or "cilio-spinal" region of the spinal cord, being that portion which extends from the first cervical to the second dorsal vertebra. He also claims that the palpitations and pulsations with accompanying nervous affections, and the vascular bronchocele, are equally due to a disturbance of function of some "oculo-spinal" region of the more extended cerebro-spinal centre of which it is a part. In Guy's Hospital Reports, London, 1870, Samuel Wilks reports a very interesting case in which there was a post-mortem examination. After giving the usual symptoms he quotes Virchow as saying that the enlargement of the thyroid is mainly due to enlargement of the blood vessels, especially the veins, but that it may go on to a fibrous induration. In most cases he found the heart enlarged, the left ventricle being dilated, but the valves sound. As regards the eye, the prominence is mainly due to a change in the fatty tissue of the orbit, which may be hypertrophied; but generally the orbital structures are merely in hyperemic condition. As Wilks says, the fact that such a remarkable combination of symptoms is constantly met with shows there must be some special derangement of the animal machinery. Some say it is due to anemia, because it is frequently seen in

chlorotic women; but there are many cases in both men and women that are decidedly plethoric. Wilks continues thus: "Of late years the sympathetic has been studied, and it is conjectured that the cause is the nervous system. It has been proved that one of the functions of the sympathetic is vasomotor, and that a paralysis of the nerve, by removing tension force from the arteries, allows them to expand, and thus the parts of the body to which they are distributed become more vascular and rise in temperature. If the cervical sympathetic is paralyzed more blood would be sent to the eye and thyroid, causing them to enlarge; at the same time the vessels would throb and heart palpitate. In confirmation, Trousseau says that in some dissections the ganglia are enlarged or indurated by inflammation of cellular tissue around them, and indeed virtually destroyed. But suppose the sympathetic be paralyzed; the enlargement and prominence might be due to that, but what quickens the heart? Experiments prove that stimulation of the sympathetic accelerates the heart, but paralysis slows the heart beat."

In the same Reports Lacy cites a case in which the cervical ganglia of the sympathetic were examined post mortem by Moxon, and I wish to quote him verbatim: "And thus the microscopic characters of these ganglia, like the macroscopic, only gave us, as signs of this disease, an apparent excess of fibrous tissue in the structure of the ganglia tissue, with apparent enlargement of the capillary vessels. Whether this excess is a morbid process, each must judge; this excess of fibrous tissue characterizes a condition known as cirrhosis, but when a state of cirrhosis exists there is always more or less of another change—viz., the destruction of the functionating elements of the organ: as examples, the liver, of the cells; kidneys, of the tubes; air vesicles, of the lungs. Now, it is to the destruction of the functioning tissue, rather than the excess of fibrous tissue, that the symptoms of cirrhosis are ascribed." He finishes by saying that he does not know whether the cervical ganglia in his case were diseased or not. There are many, though, who think the disease one of sympathetic origin. Da Costa says: "The disease originally resides in the sympathetic nervous system, more especially the sympathetic ganglia of the neck, the irritation of which disorders the innervation of the heart through the cardiac plexus and intracardiac ganglia, leading to disorderly

action and palpitation and finally hypertrophy; the enlargement of the thyroid and projection of eyes being produced by constant fulness of the blood vessels." Another view is: "While adhering to the nervous irritation, others claim that the entire disturbance can be explained by alteration in vaso-motor activity, so that the blood supply of the heart itself is affected and its nutrition impaired. Disturb this system and you will have disordered action of the heart; palpitation and the other symptoms follow naturally." Trousseau claims that the *tâche cérébrale* indicates vaso-motor disturbance. Gowers seems to think it all due to lesion of the cervical sympathetic, and in describing the pathological anatomy says there is hypertrophy and dilatation, dilatation of the arteries and veins; in the thyroid all the vessels are enlarged; in the orbit there is increase of the orbital fat, dilatation of the orbital veins, and atheroma of ophthalmic artery and fatty degeneration of orbital muscles. Then he mentions a case where there was no fat and not a trace of Müller's muscle. The exophthalmos may be due to three things: (1) increase in orbital fat; (2) distention of orbital vessels; (3) contraction of the unstriated muscular fibres of Müller.

We see, therefore, that some of the symptoms may be produced by irritation of the sympathetic and some by paralysis of the same, but not *all* the symptoms at one time by any one lesion; and, after reading the opinions and theories of many experimenters, I am inclined to think that Hammond presents the best explanation of the pathology of the disease. He says: "The theory of a central lesion is far more acceptable to my mind. In the first place, centres are known to exist, grouped together within a small area in the medulla, lesions of which result in the appearance of the principal symptoms of the disease. Filehne, in his well-known experiments, produced each of the three symptoms in turn, and in one case all three of them together —a result which has never been obtained by any single lesion made on the sympathetic. Probably the fourth symptom—Dr. Bryson's symptom—was also obtained by Filehne, but, not knowing of its existence, he probably did not look for it. In the second place, it does not seem unreasonable to attribute the principal conditions, of vagus paralysis, vaso-motor paralysis, and respiratory paralysis, which produce the four principal symptoms, accelerated heart action, enlargement of thyroid gland, exophthalmia, and diminished chest expansion, to a single cir-

cumscribed lesion affecting the vagus nucleus, the vaso-motor nucleus, and the respiratory nucleus. Polyuria, which is a frequent symptom of Graves' disease, can also be produced by a lesion in this region." It is also known to be sometimes of reflex origin; there are two or three cases reported as having been cured by operations on the nasal cavity, and one case is also reported as having been induced by the removal of a polypus of the nose by means of the galvano-caustic loop.

Knowing the symptoms so well, the diagnosis cannot be very hard, bearing in mind the three main symptoms—acceleration of the heart beat, enlargement of the thyroid gland, and protrusion of the eyes. All these symptoms may not be equally well pronounced. There may be acceleration of the heart beat or palpitation, and prominence of the eyes, and the thyroid enlargement be scarcely noticeable, or *vice versa*. I should think it well, before giving an opinion, to have at least *two* of the symptoms well marked, and then the history of the case, such as mental shock, nervous temperament, great anxiety, and other concomitant symptoms, would make the diagnosis certain.

Prognosis.—We should be very careful in giving a prognosis. While comparatively few cases are ever completely cured, the disease in itself is not necessarily fatal, but it makes the system more vulnerable to intercurrent disease, notably diarrhea, that may carry the patient off.

Treatment.—The treatment should be both internal and local. The galvanic current applied to the cervical sympathetic has probably done much good, and I feel sure that I have reduced the size of the tumor somewhat by applying the current to the gland direct. Massage to both the tumor and eyes has been beneficial.

The internal treatment should be directed mainly to the heart. Digitalis and strophanthus, either separately or, as I like them, both together, in tolerably large doses, are probably more used with good effect than any other drugs. Nitroglycerin in one-hundredth-grain doses is certainly beneficial. The carbazolate of ammonium has been highly recommended by Graeme Hammond, of New York, although I believe he gives the credit to Combes, of the Post-Graduate Hospital, for being the first to use it. I have seen it used in one or two cases, but the results were not as satisfactory as those of digitalis and strophanthus. W. C. Wile[1] reports the complete cure of a

[1] New England Medical Monthly.

case by means of galvanism; one pole (positive) was placed inside the left ear, and the negative over the seventh cervical vertebra. The current was kept up for twenty minutes daily. The only internal treatment was the syrup of hydriodic acid, given at first in teaspoonful doses and increased to two tablespoonfuls three times daily. The patient was entirely cured in seven months. Notwithstanding this case, I think the main effort of treatment should be directed to the heart. I have not had an opportunity of trying the animal extract of the thyroid gland, but if it is so efficacious in myxedema I cannot see why it should not do good work in exophthalmic goître.

826 14TH STREET, N. W.

TWO CASES OF PHLEGMASIA DOLENS.[1]

BY

J. T. WINTER, M.D.,

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DURING the month of January of last year I was called to Mrs. C., a primipara, who was in her ninth month of pregnancy. She informed me that for several years past she had been having considerable trouble with her kidneys, for which she had been under treatment a number of times; that she had been in better health since her marriage, and especially since she became pregnant, than for many years, but that she feared she was going to have trouble with her kidneys again, as she had noticed for the last few weeks that the quantity of water voided was gradually growing smaller and smaller, certainly not more than half a pint in twenty-four hours, and that she was now wearing a pair of her husband's shoes, as her feet were so swollen she could not get them into her own.

On examination I found her feet, legs, and vulva to be enormously swollen, pitting on pressure, and that her urine contained a large per cent of albumin. Her face and arms were also swollen, as was her whole body, but not to so great an extent as her legs. I began treatment by giving her an active

[1] Read before the Obstetrical and Gynecological Society of Washington, March 18th, 1892.

cathartic, and a diuretic and diaphoretic mixture containing nitrate of potassium, sweet spirits of nitre, and fluid extract of jaborandi, but was unable to materially increase the quantity or improve the character of her urine before labor came on, which fortunately was completed in a little over four hours, without instrumental interference or mishap, although she was on the point several times of convulsions, which were prevented by the use of chloroform by inhalation and by a single hypodermatic dose of morphia ¼ grain with atropia $\frac{1}{150}$ grain.

Twenty-four hours after her confinement she looked worse, if possible, than before. Her face was now quite edematous, eyes almost closed. She had passed up to this time but very little water, not more, perhaps, than one-third of a pint. I now gave her eight grains of calomel, to be followed the next morning with a seidlitz powder, and continued the diuretic mixture, from which we had good results, and in the course of the next few days the swelling gradually disappeared from the upper part of her body; but there was still some swelling in her ankles and albumin in her water on the tenth day after her confinement, when she was allowed to be up for a couple of hours. She was up and about her room from this time until the nineteenth day, when, shortly after getting out of bed, she was seized with a severe pain in the calf of her right leg, which by night had shifted to the left, and back again by morning to the right, thus shifting and changing every few hours for two days and nights, fixing finally in the right; the pain being most severe in the knee, but gradually extending in the course of the next two days to the ankle and groin, taking on in the meantime a decidedly inflammatory condition. There was now heat, redness, swelling, and exquisite sensitiveness to the touch, especially along the inner side of the thigh. Bright-red streaks, commencing at the ankle and running upward to the thigh, showed themselves within a few hours after the pain settled in the right leg. These little lines or streaks of redness felt hard to the touch, and the patient complained that there was a burning sensation in them which was increased by the slightest pressure. Some portions of the tract of the femoral vein also assumed a livid hue and became knotted in places. The inguinal glands became enlarged, and the symptoms gradually grew more severe for the next few days, so that by the twenty-ninth day the redness had assumed an erysipelatous character, blisters forming in

a number of places. During this time, and up to the thirty-fifth day, she suffered great agony from her leg, which was larger, if possible, than before her confinement, and would still pit on pressure. Her tongue was dry and coated, cheeks flushed, skin hot and dry, pulse 120 to 136, full and strong, temperature 102° to 104⅘°, and urine scant and high-colored. On the morning of the thirty-fifth day there seemed to be a decided improvement, the temperature was down to 100°, and there was less pain in the leg; but during the evening, without any premonition, she was seized with a severe chill, followed a few hours later with pain in her right breast, so severe as to prevent her taking a full inspiration. This, however, was relieved, during the course of the night, by the application of hot linseed-meal poultices, but there was some cough and crepitus of right lung for several days. The pain and difficult breathing returned each evening for four days, but would yield quickly to the hot poultices. Four days later, the thirty-ninth day after her confinement, she had another rigor, followed by pain and swelling, but no redness, of her left leg, which was of but short duration, lasting only a few days, but the pain and swelling continued in the right leg for about two weeks longer, the erysipelatous condition having improved rapidly after the thirty-fifth day. She was not able to be out of bed again for nearly nine weeks after her confinement, and even then her ankles were swollen some little and would pit on pressure, and her urine still contained albumin, sometimes only a trace, as it does to-day.

The next case is that of a short, stout German woman, 47 years old, to whom I was called, in the early morning of one of those beautiful and scorching June days of last year, to attend in her thirteenth confinement. The labor was perfectly natural and satisfactory until after the birth of the child. The uterus was fairly contracted, and for a short time all seemed to be going well. With my left hand on the abdomen, grasping the uterus, I passed the fingers of my right hand along to the cord, so as to know the condition of the placenta, and in doing so found that there was a considerable quantity of blood escaping from the uterus. The placenta was delivered as quickly as possible, but not until a large quantity of blood had been lost, as it came several times in gushes, being shot out as if from a syringe. The flow not ceasing on the delivery of the placenta, and the woman being almost exhausted, I called for ice, which I passed, in

pieces as large as a hen's egg, into the cavity of the uterus, almost filling it. I in this way kept up the external pressure and the internal local use of ice for fifteen minutes or more, when, in answer perhaps to the ergot which had been previously given, as well as to the use of the ice, the flow ceased. I cannot, of course, give the quantity of blood that was lost, as it was passed into the bed clothing, but it was quite large and the woman was dreadfully prostrated, almost pulseless; but after several generous doses of brandy she gradually improved, and continued to do so for the next forty-eight hours, when she was seized with violent abdominal pain, lasting only a few hours at a time, and recurring at short intervals for several days, so severe at times as to require the use of anodynes. Warm applications were also made to her abdomen at these times, which were found to afford her a great deal of comfort. She claimed that the ice used in controlling hemorrhage was the cause of her trouble; that she had just such pains once before, from the same cause, after the birth of her fourth child, which were followed by milk-leg; and that she believed she was getting milk-leg again. The pains gradually ceased, so that by the sixth day she was perfectly comfortable again. This improved condition was, however, of but short duration, as the abdominal pains returned on the ninth day, and gradually extended during the next three days to the hip and down the right leg until they reached below the knee, causing great pain and swelling, as well as complete immobility of the limb, and its surface assumed a glossy paleness or whiteness. The inguinal glands also became swollen and exceedingly tender to the slightest pressure. This condition lasted for two weeks, during which time the countenance became very anxious and the tongue loaded with a yellowish fur. About 6 o'clock each evening she would have a chill, followed by a hot and a sweating stage. Toward midnight she would usually fall asleep and not waken until late the next morning. She was treated during this time with quinine and anodynes internally, and by soothing applications, hot vinegar, soap liniment, etc., to the leg, which was enveloped in flannel from foot to thigh. The oleate of mercury was also used several times, being rubbed in over the enlarged inguinal glands and along the inner side of the thigh, but had to be discontinued, as it was found that her gums were getting a little too tender. By the thirtieth day the pain was almost entirely

gone, after which it was impossible to keep her in bed, but the swelling still continued and was not entirely gone until the seventh week. There was no pitting on pressure. The lochia were free and never offensive in this case, but great care had to be taken with the first patient; the lochia were free enough, but the parts had to be disinfected twice daily for a part of the time. During the intensity of the fever the secretion of milk became very scant in both cases, but was re-established after they got about.

The plan of treatment adopted in these cases was to support the strength, keep the bowels regular, give anodynes to relieve pain and secure rest, and soothing applications to the limb, which was enveloped in flannel bandages and covered with oiled silk.

The symptoms in these cases were entirely dissimilar, but they were both, I think, genuine cases of phlegmasia dolens. In the first case there were no premonitory symptoms which could point to an existing uterine irritation, the patient being suddenly seized with pain in the calf of the right leg, shifting in a few hours to the left, then back to the right, locating finally in the right knee. There was also heat, redness, and swelling, making it look more like rheumatism than anything else, and it was for rheumatism that I first prescribed; then it assumed an erysipelatous character, then it attacked the right lung and then the left leg again. While in the other case the ordinary premonitory symptoms, commencing with pain and uneasiness in the abdomen, gradually extending along the brim of the pelvis and down the leg, were present; and when the swelling came on, instead of redness, there was a milky whiteness of the skin, which would not pit on pressure.

Many observers agree in considering phlegmasia dolens as essentially an obstructive disease, claiming the cause of such obstruction to be a phlebitis resulting from the absorption of a morbid material, or the extension of inflammatory action from contiguous parts, thus making it purely a local disease; while others, who also look upon it as a phlebitis, claim that it is the result of a peculiar blood state, and as such is a part only of the existing disease.

Many also claim that it is a disease peculiar to women, occurring in those who have suffered from uterine irritation or inflammation, and that it is, as a rule, an extension of inflammation from the uterine vein. Still it is a matter of fact that men have suf-

fered from this disease. It is found also, in more than one instance, to have followed a severe diarrhea, the rapid loss from the intestinal canal, calling for rapid absorption by the venous system, being perhaps the exciting cause, and an inflammatory condition of the veins a result. The lymphatics also appear to play an important part in this disease, as they have most to do with tension and color, while the veins have most to do with the swelling.

THE APPLICATION OF GRAPHICS TO THE FETAL HEART SOUNDS.[1]

BY

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(With four illustrations.)

It is unnecessary to consume time to relate the history of the discovery of the sounds of the fetal cardiac pulsations in pregnancy, or even the many instruments devised to easily recognize them. The bibliography of the subject is readily accessible. The object of this paper is to show how electricity may be applied to magnify and record their *bruits*.

Among the signs of pregnancy the fetal heart sounds are the surest of a number of phenomena. They are prominently mentioned as certain in most text books. However, in some positions of the fetus they are difficult to find, or may be even, to the experienced ear, qualified by one's preconception of the case. The design of my instrument is to lift their recognition from the domain of sense to that of record by permanent tracings which may be differentiated or compared with those of maternal origin.

To accomplish this I have modified a microphone suggested by Hürthle, of Breslau,[2] carefully noting the criticisms of Martius, of Rostock,[3] which it is not essential to reiterate here.

[1] Read before the Section on Obstetrics, Pan-American Medical Congress.

[2] "Ueber die Erklärung des Cardiograms mit Hülfe der Herztonmarkirung, und über eine Methode zur mechanischen Registrirung der Töne."

[3] "Cardiogramm und Herzstossproblem."

The instrument is made as follows: A double cone of electric-light carbon is held between two cups of the same material (see Fig. 1) placed in electrical circuit with the primary wire of an induction coil. A lever bearing one of these cups is attached to a diaphragm of vibrating material, as the thinnest parchment



FIG. 1.—The carbons, twice the natural size: *a* showing countersunk section of *c*; *b* showing double cone.

paper, fastened on the top of a receptacle, to convey the vibrations to the membrane. The other carbon cup is held by a movable post capable of being minutely adjusted, the two supporting the double-coned carbon between them and making a commutator for the apparatus.

The secondary wire of the induction coil is connected in closed



FIG. 2.—Cardiophone.

circuit with an ordinary telephone receiver, and also with the sciatic nerve of a freshly killed frog, rat, or mouse. This most sensitive galvanometer is in turn attached in balance to a Maurey tambour.

The slightest movement of the tympanum of the cardiophone will now cause the telephone receiver to vibrate, so that it can

be heard for three to four metres (ten or twelve feet), and the nerve of the frog leg to contract and record its markings on blackened (smoked) paper fixed on a drum, one hundred and fifty millimetres (six inches) in diameter, making one revolution in four or five seconds. Placing one cardiophone on the aorta of the mother and another upon her abdomen at the proper point, connected in two circuits, they are brought to record on

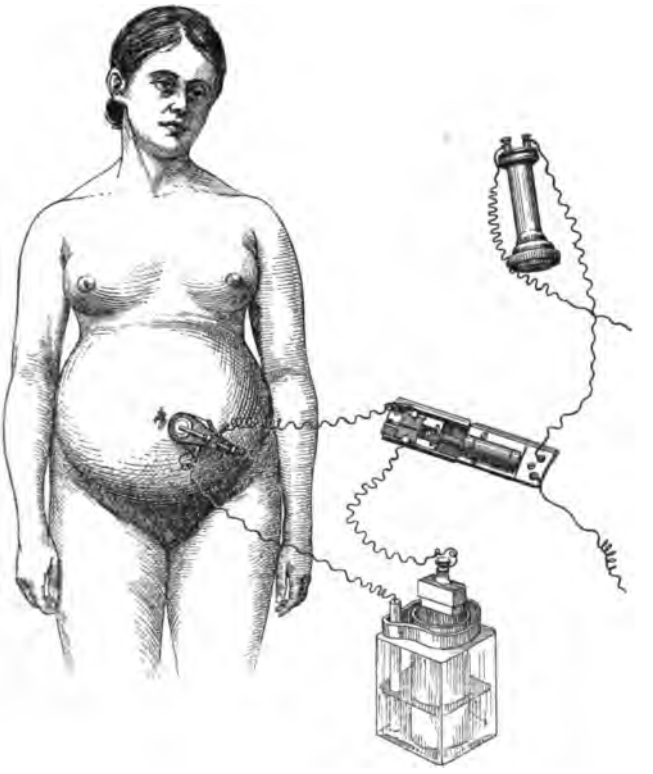


FIG. 3.

the same cylinder. The pulsations of the fetal heart being 120 to 160 and the cardiac impulses of the mother from 70 to 80 per minute, makes the difference in the cardiographs easily recognizable. (See Fig. 4.) Should the several souffles give symmetrical markings, then it would be conclusive evidence of their being maternal.

It is necessary to search for the supposed sounds of the fetal heart and then place the cardiophone on the best point for hear-

ing them. The tracings will show whether they are maternal or fetal. I have only completed the instrument sufficiently to take one tracing, but hope to perfect its mechanism so that it may be of practical benefit in the differential diagnosis of pregnancy from tumor conditions. The whole apparatus, when completed, will occupy a box 75x75x150 millimetres (3x3x6 inches) and weigh about one hundred and twenty grammes, or about one-quarter of a pound. The telephone receiver is not necessary; any indicator will do: its use is only confirmatory of the sounds

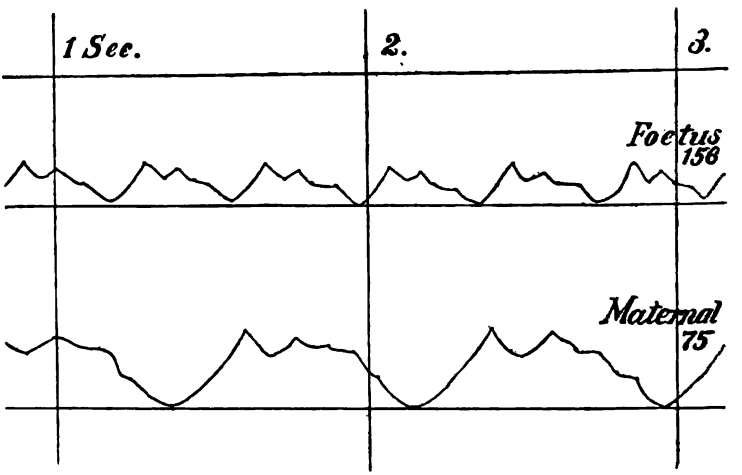


FIG. 4.

heard, and to show when to throw the recording apparatus in circuit.

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TRANSACTIONS OF THE PAN-AMERICAN MEDICAL CONGRESS.

HELD AT WASHINGTON, SEPTEMBER 5TH, 6TH, 7TH, AND 8TH, 1893.

SECTION ON GYNECOLOGY AND ABDOMINAL SURGERY.

First Day, September 5th—Afternoon Session.

The Vice-President, DR. L. S. MCMURTRY, *of Louisville, Ky., in the Chair.*

After the address of welcome by the Chairman, DR. ANDREW F. CURRIER, of New York, read the first paper, entitled

THE INTRA-UTERINE TAMPON.

Dilatation, curetting, and drainage were the three principal foundation stones upon which intra-uterine treatment might be said to rest. From the propriety of dilating the uterus to that of packing it with a tampon was a logical step. The vaginal tampon was an indirect and often unsatisfactory means of relieving uterine trouble. The intra-uterine tampon went directly to the source of the trouble, and had opened a new field in intra-uterine therapeutics. Sterilized gauze was the material which offered the greatest number of advantages for such a tampon. In the gravid and puerperal uterus it might be used: 1. During the period of gestation. 2. During parturition. 3. Post partum, whether the labor occurred at term or prior to it. In the unimpregnated uterus its use was for: 1. Exploratory and operative purposes in connection with disease of the uterus and its appendages. 2. Hemorrhage. 3. Endometritis. 4. Stenosis. 5. Accumulations within the Fallopian tubes.

In the gravid uterus the intra-uterine tampon might be used in place of the vaginal tampon to bring on uterine contractions and empty the organ, or occasionally to ward off an abortion. In placenta previa it might be of signal service. With uncontrollable vomiting, the presence of a dead fetus, or serious mechanical obstruction in the parturient canal, the tampon was preferable to bougies, bags, or tents for the purpose of inducing an abortion. During parturition, if the first stage was pro-

tracted, the tampon might be used to assist dilatation. It was preferable, for several reasons, to the means which were in vogue. Post partum the tampon was useful for hemorrhage, as recommended by Dührssen, also for the hemorrhage which followed abortion, and for sepsis after either abortion or labor at term, in connection with curetting and irrigation. If there was subinvolution the tampon was indicated also, for it stimulated the uterus to contraction and produced free depletion. In the unimpregnated uterus it was useful for dilatation in the presence of new growths, whether benign or malignant, especially if slow dilatation was desirable. If the appendages were to be removed for inflammatory disease, a precedent curetting and tamponing would be useful by producing free drainage and depletion. The tampon in these cases was a substitute for the uterine tent.

For the relief of hemorrhage the direct pressure of the uterine tampon excelled the indirect pressure of the vaginal tampon. In endometritis with suppuration, hypertrophy of the endometrium, or inertia of the uterine muscle and stasis of the venous circulation, dilatation with drainage by means of the tampon would prove very serviceable. Stenosis was believed to be an efficient cause of the prevention of egress of fluids contained within the uterine cavity. Its treatment with dilatation and the tampon was recommended.

The usefulness of the tampon for the drainage of accumulations within the Fallopian tubes was believed to be of limited scope, depletion of the uterus, its cornua, and those portions of the tubes immediately contiguous being the area which it was most likely to reach. If the tubes were greatly displaced and if there were ovarian or circumtubal abscesses, little or no benefit would result from the use of the tampon. The tampon should always be used with caution, but it did not follow that it always required an anesthetic or the same adjuncts which would be called for in a major surgical procedure. There were many cases in which it was safe and proper to use it in office and dispensary practice, especially if it was not to be inserted beyond the os internum. It should usually be preceded by curetting, irrigation, and sufficient dilatation to permit of easy introduction of the gauze strips of which it was composed. The tampon might be safely retained from a day to three days. It was better to renew it frequently and secure gradual distention than to pack in too much material at the first sitting. It might be so modified as to quantity, firmness, and duration of retention that there were few if any cases in which intrauterine treatment would be admissible in which it was contraindicated.

Dr. R. B. Maury, of Memphis, Tenn., said that the time was not very long past when we all hesitated to touch a uterus with an instrument, and that to the use of the tampon we were

largely indebted for our ability to attack an inflamed uterus with safety. He desired simply to add his testimony in one class of cases alluded to by Dr. Currier—viz., inflammation following confinement. Often we are called to a case apparently normal in every respect, but to our surprise the patient begins to have fever about the third day. Apparently there is nothing to account for it until we examine the cervical canal, when we find a large quantity of pent-up secretion in the cavity. Dilatation, curettage, and packing with gauze soon check that trouble. He generally found that the use of a cervical dilator is of great assistance in introducing the tampon.

Dr. G. Betton Massey, of Philadelphia, Pa., failed to see how plugging up the uterus with gauze could be called drainage. In his experience such procedures always prevent drainage. He admitted that such treatment might indirectly have good results by setting up an irritation in the inflamed area and thus act as an alterative. He thought there was a better way of accomplishing good, especially in inflammation of the tubes where genuine drainage is essential, and this was by the use of the galvanic current. He uses an electrode made of absorbent cotton and moistened with some medicated solution, and by introducing this into the cervical canal and applying the galvanic current cataphoretic drainage is produced. Another point in favor of the electrical treatment is that much less interference with the uterus is demanded, and the cervix does not have to be dilated even in stenosis. He thought that the ease with which these cases could be cured by electricity, and the infrequence of the applications necessary, as contrasted with the constant replacing of the tampon, a most cogent argument in favor of the former method.

Dr. Joseph Taber Johnson, of Washington, D. C., spoke of the large amount of cotton or gauze necessary in these cases. He recalled one case where death was expected from post-partum hemorrhage, but the uterus was finally stuffed with iodoform gauze (about a square yard) and then with handkerchiefs and napkins until it was filled. He believed that in cases of salpingitis associated with endometritis, where the tubes are occluded and dilated by collections of fluid, the drainage and contraction set up by the foreign body in the uterus might relieve the condition and finally come to supersede more radical operations. He disagreed entirely with the statement of Dr. Massey that because the uterus was plugged up, therefore the fluids were retained in the cavity, and he asserted that by means of the capillary attraction set up by the tampon large amounts of fluid were drained out.

Dr. Ernest W. Cushing, of Boston, Mass., fully indorsed Dr. Currier's statements of the value of the intra-uterine tampon, especially in the parturient uterus and after abortions. He was glad Dr. Johnson had mentioned the use of handkerchiefs,

napkins, etc., in emergencies, and he thought it a good idea. In one or two particulars he took exception to the statements of Dr. Currier, and he agreed with Dr. Massey in thinking that tamponade in cases of stenosis would not accomplish the desired result. In cases of anteflexion he used to use hollow cervical tubes, but soon found that they were unnecessary, and now, following the example of Martin, he dilates and curettes the uterus thoroughly. The double-current irrigators were also useful instruments in treating these cases. He curettes the uterus every time he performs an operation upon that organ, whether it be for repair of the cervix, to correct congenital malpositions, or for other indications. The principal object is to get the uterus cleaned out.

Dr. A. Vander Veer, of Albany, N. Y., thoroughly indorsed all Dr. Currier's statements, and he said Dr. Massey was in error in claiming that the uterus is not well drained by the intra-uterine tampon. Dr. Johnson, he said, had thoroughly explained the rationale of it. He believed with Dr. Cushing that in laceration of the cervix the uterus should be curetted. Years ago he had used electricity faithfully, but he had not had the good results which Dr. Massey claimed for that treatment. It was his opinion that in dilating, curetting, and packing the uterus the profession was pursuing surgical methods and was on the right track.

Dr. J. H. Carstens, of Detroit, Mich., considered packing the uterus, like many other procedures, a fad. The danger lies in the propensity of the general practitioners throughout the country to attempt this operation because it seemed devoid of risk; but it will only get these men (who have not the skill of Dr. Currier) into trouble. Placenta previa is the only condition he knew of where the tampon is indispensable. If it is desired to keep the uterus straight in order to give the muscles and ligaments a chance to regain their tonicity, it would be safer to use a stem pessary.

Dr. Currier, in closing the debate, said that the first object sought for in the reading of his paper was to impress on all minds the principle of drainage, as every one, whether his practice be general or special, is called on to make use of it. In regard to the principal objection raised by Dr. Massey—viz., that the tampon sucks up serum rather than drains it—that criticism had been answered by Dr. Johnson, who explained it by the principle of capillary attraction. The speaker did not claim that the tamponade would displace the curette, but all will admit that there are cases in which the curette is not applicable, and in those cases the tampon has a place. He believed that the intra-uterine tampon has a wide field of usefulness and that many diseases can be cured by its proper use.

Dr. Joseph Taber Johnson, of Washington, D. C., read the next paper, on the

TREATMENT OF EXTRA-UTERINE PREGNANCY AFTER THE VIABILITY OF THE CHILD, WITH REPORT OF TWO CASES.

There should be no trusting to chance in the presence of this condition, no matter what period had been reached when the diagnosis was made. All means which were not surgical were to be discarded entirely. The rights of the child in all such cases were insignificant compared with those of the mother. If viability had been reached, one should not wait until term or until the fetus died and decomposition took place. That meant exposure to, and possible death from, sepsis. If it were possible, the placenta should be removed with the fetus, but this was not always essential and often involved grave danger from hemorrhage. The question of technique when the child was viable was still undergoing evolution. There had been thirteen recorded cases in which living children had been removed, including two by Americans—Eastman and Lusk. The important points in such cases were to act rapidly and to avoid severe hemorrhage. Two cases were narrated in which the author had operated after viability had been reached, the first in the eighth, the second in the twelfth month of gestation. The first was fatal from difficulty connected with the placenta; the second was successful, the ovum being removed entire and with very little loss of blood.

Dr. Joseph Price, of Philadelphia, Pa., said that the first operation for extra-uterine pregnancy was done in Virginia in 1790 by William Baynham, and he claimed for America the proud distinction of being the birthplace of this operation. It remained for Tait to re-establish the same operation many years later. The attempt of some operators to establish rules of procedure in the operation, with a single experience to go by, he thought extremely ill-advised. With an experience derived from eighty-six cases in his own practice, he would not be willing to lay down hard-and-fast rules for the operation in late cases approaching full term. As to the removal of the placenta, there were some surgeons in the room, he said, who had seen everything flooded in a few seconds and obscured by blood in attempting to remove a placenta. When the placenta remains *in the sac or tube, or about the broad ligament, it can be, and should be, removed; but when it is firmly implanted on the bladder or intestines or iliac fossæ, and living, it should be let alone.* If the placenta has ceased to live it should be removed; and if hemorrhage occur, firm pressure or a sponge packing, followed by drainage, will control it. Enucleation of the sac or broad ligament has never been done by Dr. Johnson or any one else. Dr. Johnson's case ruptured into the broad ligament; but

when it ruptures into the abdominal cavity, with a grafting of placenta on all surrounding viscera, enucleation becomes a trying matter. In the speaker's opinion, if Dr. Johnson had simply removed the fetus and washed and packed and drained the cavity, he would have saved the patient's life. Those very cases where a man declares he has stitched the sac are the favorable cases for enucleation. If the product of conception remains in the tubal sac, enucleation is fairly easy and safe; but if the rupture has taken place into the abdominal cavity, and the placenta has become engrafted upon new structures, it is an extremely dangerous operation if the child is living. The speaker agreed with Dr. Johnson that all these cases belong to surgery. There is only one treatment—the removal of the gestation sac—just as there is but one person to be considered—the mother. As to the use of electricity, he did not believe in it. It is wiser to counsel the country physician to just open the sac and remove the fetus and clean out the cavity, leaving a place for drainage, and he will do very much better than he could with any amount of tinkering with electricity.

Dr. Ernest W. Cushing, of Boston, Mass., recalled a case in his practice where there were no signs of fetal life. Nevertheless he decided that it was a case of extra-uterine pregnancy, and, fearing hemorrhage if he operated then, he decided to wait until the fetus was dead beyond a doubt. When he opened the abdomen he found a child in about the ninth month. It had grown in the tube, which had formed a pocket or cup-like cavity, and when this was opened the placenta protruded. This he tore away, but when he attempted to remove the remainder there came a profuse hemorrhage, which he had great difficulty in stopping with gauze packing. The woman finally recovered. He had recently seen another case of tubal pregnancy at about the third month. There was a hemorrhage from the end of the tube, and a quantity of dark fluid blood was in Douglas' pouch, which was shut off by adhesions. He believed that if the second case had been allowed to go on it would have been similar to the first. He did not believe that all cases of extra-uterine pregnancy which go to full term are between the folds of the broad ligament, as Tait claims.

Dr. G. Betton Massey, of Philadelphia, Pa., said he would not have projected himself into the discussion but for the remark of Dr. Price that there was but one treatment for these cases—removal of the gestation sac. He believed that the use of electricity would often result in the death and absorption of the fetus and the recovery of the patient. He thought that the use of this agent should be the only treatment for the first three or four months, and that the death of the fetus should always precede an operation, as the danger of hemorrhage is then a great deal less. He had records of two cases successfully treated by electricity. In one of these cases the woman was afterward

operated on for a hematoma, but she would have gotten well without this operation. He agreed with Dr. Johnson's statement that in some cases where expert surgery is unavailable—and even when expert surgery *is* available, he added—the electrical treatment is best. Of course the use of the knife is the proper method of procedure in some cases, and always when the bones are formed; but usually the use of electricity is better, because safer. He expressed some doubt as to the accuracy of the mortality statistics of the operation, and asked Dr. Price how many patients he had seen survive.

Dr. I. S. Stone, of Washington, D. C., described two cases of extra-uterine pregnancy occurring in his practice. One was a young woman who was very pale and anemic and looked like one dying of phthisis. The pregnancy had gone to the fifth month, and the sac, which was in the broad ligament, was unruptured. The operation consumed only fifteen minutes, for her pulse was almost imperceptible, and the sac was sewed to the peritoneum. The hemorrhage was continuous, and the sac was distended with blood from partial separation of the placenta. The hemorrhage was checked by packing gauze in on top of the placenta, and she made a good recovery. In the second case, occurring in a woman otherwise healthy, the pregnancy had lasted three and a half months, and the fetus, as in the first case, was dead. He removed the sac, tied all bleeding points, and the patient recovered promptly.

Dr. J. H. Carstens, of Detroit, Mich., agreed with Dr. Price that it was not always possible to remove the placenta, and also that there was but one way of treating an extra-uterine pregnancy—viz., by operating. He had once operated upon a woman for peritonitis with pus tubes, and when he opened the abdomen he found a fetus of about three months. She had been treated by electricity three years before, but, as was shown in his case, electricity did not cause absorption of the fetus. In another case, also treated with electricity, he had found the products of conception after seven years, and she had suffered from it all that time.

Dr. Joseph Price, of Philadelphia, Pa., claimed that electricity had no place in the treatment of ectopic gestation nor in gynecology. If Dr. Johnson had simply removed the fetus in his case, and had not attempted to remove the entire sac, he would probably have saved his patient. In answer to Dr. Stone's question as to whether he advised against the removal of the sac if the case is seen in the early months of pregnancy, he replied, No; that while the placenta lives it should not be removed; but when the fetus, sac, and placenta have all ceased to live and have shrivelled up, then removal is easy and proper. Early in tubal pregnancy everything should be removed—tube, fetus, and sac. Referring to one of the cases mentioned by Dr. Massey (the woman afterward operated on for hematoma), in

which Dr. Massey claimed to have destroyed the fetus by electricity, the speaker said the fetus was dead before the applications of electricity were made. In answer to Dr. Massey's question as to the mortality of the operation, he said he had had a series of eighty-six cases with three deaths. It is folly, he said, to speak of those cases which have been treated according to Dr. Massey's method as having been saved by electricity: it is by surgery they are saved. There is nothing but direct, positive surgery to be thought of in these cases, first, last, and all the time.

Dr. Johnson, in closing the discussion, expressed his pleasure that so much attention had been paid to his paper. There was one point made by Dr. Price that he wished to speak of, and that was the statement that it was not possible to enucleate the sac when it had ruptured into the folds of the broad ligament. He supposed the broad ligament grew to accommodate the growing sac, and it seemed to him that what he did in the case of his surviving patient was really an enucleation from the folds of the broad ligament.

Papers on

THE CO-ORDINATION OF THE MUSCLES CLOSING THE URETHRA, VAGINA, AND RECTUM, AND ITS APPLICATION TO THE PRECISE DIAGNOSIS AND SURGICAL TREATMENT OF INJURIES OF THE PELVIC FLOOR,[1]

by Dr. A. W. Abbott, of Minneapolis, Minn., and

PERINEO-VAGINAL RESTORATION,[2]

by Dr. Edward W. Jenks, of Detroit, Mich., were then read by title.

Second Day, September 6th—Morning Session.

THE TECHNIQUE OF TOTAL EXTIRPATION OF THE FIBROMATOUS UTERUS.[3]

By Dr. George M. Edebohls, of New York.

HYSTERECTOMY: INDICATIONS AND TECHNIQUE.[4]

By Dr. J. M. Baldy, of Philadelphia, Pa.

Dr. H. J. Boldt, of New York, considered Dr. Baldy's paper of too wide a range to be intelligently discussed, as he had considered all classes of tumors. Dr. Edebohls, on the contrary, had confined himself to one line of cases and operative procedure. He had no comments to make on Dr. Edebohls' paper, except to indorse his method of packing the vagina, and

[1] See original article, p. 635.
[2] See original article, p. 638.
[3] See original article, p. 606.
[4] See original article, p. 593.

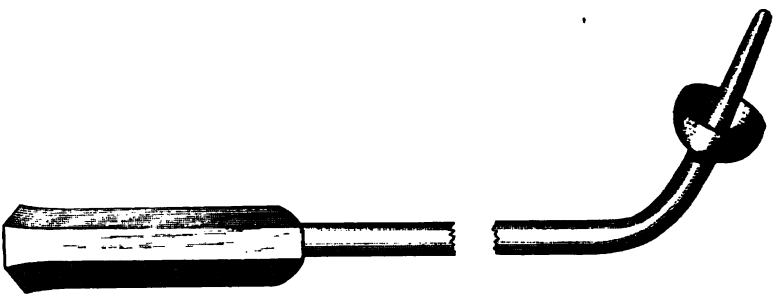
he considered the technique perfect. He denounced all operations from below, except when the nature of the case made that the more feasible route. Where there is an unyielding pelvic floor, or where we have the tumor low down and the pelvic floor rigid, the vaginal operation can be done quicker and with better results than the abdominal operation alone. Again, when the tumor is in the lower segment of the uterus or in the posterior wall of the cervix, so that we cannot get enough tissue for a stump, the operation for total extirpation is the only one which should be considered. Women who have lost a great deal of blood cannot stand total extirpation as well as supravaginal hysterectomy, and the mortality is so great that we shall be doing extremely well if we reduce it to fifteen per cent.

Dr. J. H. Carstens, of Detroit, Mich., said it was impossible to lay down any abstract rules for treatment. Dr. Edebohls, with his nice institutions and Trendelenburg postures and favorable surroundings, could do this ideal operation, but the speaker would like, or rather he would not like, to see it attempted by the great majority of surgeons. As to the use of clamps or ligatures, he thought the former were better, except in a well-equipped hospital. A great many patients could be saved by the use of the clamp, whereas they would be lost if the ideal operation of Edebohls were attempted.

Dr. Charles P. Noble, of Philadelphia, Pa., was very much pleased with the technique of Dr. Edebohls, as the loss of blood by this method would be very little. At the same time he believed it was applicable only to simple cases where the tumor is small and can be easily delivered. He considered abdominal amputation better than total extirpation because of its greater simplicity. He begins by ligating the broad ligaments (using clamps alongside of the uterus and cutting between ligature and clamp), and instead of three ligatures on each side he uses four, five, or six, as he believes it necessary to use that many in most cases. Having reached the uterine arteries, he ties them off, passing the ligature well down along the vagina, when the tumor can be cut off without trouble and without fear of hemorrhage. In one of his operations he had stitched the bladder over the cervix, because it was not possible to form the usual peritoneal flaps. The main question in supravaginal amputation is the nature of the stump. The profession has got into the habit of speaking of intra- and extraperitoneal stumps, but in Baer's method the cervix is not the stump at all; the broad ligaments are the stumps. It is a mistake to say we have no stump in total extirpation; there are two stumps—the broad ligaments. In his experience ovariotomy for fibromatous uteri had been very successful, he having operated seventeen times for this condition, and in only one case does the patient now suffer—a case in which the tumor, from its size and position,

acts as a ball valve in the pelvis, thus interfering with defecation.

Dr. I. S. Stone, of Washington, D. C., said his experience in the new operation for total extirpation of the uterus was limited to seven cases, nearly all of which were done in the last six or eight months. He had only two cases to the credit of Baer's —or, as he believed it should be called, Goffe's—operation. One operation was begun for the removal of the ovaries to check the growth of a large tumor; but large sinuses compelled the removal of the tumor, which was done successfully. In one case he had removed a tumor weighing twenty pounds, but he lost his patient from mesenteric hemorrhage. He thanked Dr. Edebohls for his suggestion in regard to tamponing the vagina, which had well repaid him for attending the Congress. He exhibited a uterine staff or elevator intended to facilitate operations from above, and to take the place, to a certain extent, of the Trendelenburg posture.



Stone's uterine elevator.

Dr. Andrew F. Currier, of New York, praised the method described by Dr. Edebohls, which, he said, might without impropriety be called the New York method. He had done this operation in three cases, and had assisted others in a number of additional cases. Instead of the preliminary packing of the vagina with gauze, as advocated by the author, it is his habit to wait until the vagina has been incised from above and then introduce the packing from that point. He replied to the statement of Dr. Noble that stumps *were* left in this operation by saying that exceptionally the peritoneum is stripped away from the front and rear of the uterus, the leaves of the broad ligaments are separated, the separation is extended up as far as the round ligaments, and, of course, practically nothing remains to form a stump. Patients who are very anemic from prolonged loss of blood are ill-suited to withstand the prolonged operation of total extirpation, and in these cases the ideal operation cannot be done. It is the life of the patient we are aiming at, not ideal surgery. Hegar's operation for the removal of the

tubes requires but a short time and is the better operation in these cases. Afterward, when the woman's condition has improved, another operation for the total extirpation of the uterus can be done. He had found supravaginal hysterectomy the most desirable operation in cases of cancer, and with improved methods is better than the operation through the vagina. The chief objection to that operation is that sometimes the peritoneum and peritoneal tissue are so firmly adherent to the uterus that it is extremely difficult to dissect them away.

Dr. Henry O. Marcy, of Boston, Mass., said that in 1880, when he first published his views on the pathology and surgical treatment of uterine fibromata, he had strongly advocated the intraperitoneal treatment of the stump after resection, but he had found few operators who were willing to adopt them. In young subjects with small but rapidly growing myomatous tumors of the uterus, the removal of the appendages should be taken into favorable consideration, as this operation is of minimum danger and is usually followed by an arrest of the growth or a great improvement in the condition of the patient. When the tumor has developed in a way to cause an elongation of the cervical portion of the uterus, it may not be difficult to treat the stump extraperitoneally by fixation of the pedicle in the lower angle of the wound; but the great majority of sufferers who resort to the surgeon have developed pelvic growths which render extraperitoneal treatment of the pedicle in the lower angle of the wound impossible. He agreed in the main with the methods pursued by the authors of the papers. The use of the Trendelenburg position is of signal advantage. The abdominal incision must be sufficiently long to admit of free access to the tumor, which must be lifted from the pelvic basin sufficiently to permit of the ligation of the great vessels on either side. When the growths are of large size and multiple they may be enucleated in order to furnish more room. It is usually wise to commence on either side above the selected site of the division of the pedicle, and dissect down the peritoneal envelope to the cervical structures. Through this base it is better to sew with a double continuous tendon suture before division. After resection a drop of liquid carbolic acid applied to the cervical opening makes safe disinfection. The resected peritoneal cuff is resected to the desired size and closed with a continuous Lembert *parallel* suture. Dr. Marcy then closes the abdominal wound in layers of animal sutures, and seals it with iodoform-collodion without drainage. Hemorrhage sometimes occurs from ectatic ovarian veins, in which case it is better to enclose all the tissues with a line of double continuous sutures taken quite deeply into the broad ligaments, including the uterine arteries. When the pedicle is comparatively long, Dr. Marcy often uses a rubber dam, as the dentist surrounds a carious tooth, and constricts the base with an elastic ligature. Some of the

speakers had said that it was the life of the patient which they had in view, and not ideal surgery, but Dr. Marcy maintained that "ideal surgery" means the life of the patient. Opening of the vagina, necessitated by the removal of the entire cervix, adds to the danger of peritoneal infection; the vagina is foreshortened, and, the cervical attachments of the broad ligaments having been lost, both bladder and rectum are deprived of an important support. Vaginal disinfection, curetting of the cervical structures, and tamponing of the vagina with iodoform gauze are important preliminary steps, and may be wisely done before etherization. Dr. Marcy closed by paying a tribute to the memory of the late Dr. Minor, of Buffalo, and predicted that in the near future the method as outlined by him would be the rule, and not the exception, to guide the surgeon in the treatment of ovarian cystomata.

Dr. E. E. Montgomery, of Philadelphia, Pa., said that when it comes to a consideration of the question of whether complete extirpation of the uterus should be done or a part of the cervix should be left as a stump, we must be governed by the individual case. Where there is but a small stump the operation of Eastman, Baer, or Goffe, as you may choose to designate it, is indicated. His method is to ligate the ovarian arteries on either side *en masse*, grasping the broad ligament with a hemostat near to the uterus and cutting between the forceps and ligatures. Peritoneal flaps are then made anteriorly and posteriorly, the broad ligaments split, and the uterine arteries ligated. The remainder of the operation consists in the removal of the entire organ, or by cutting through the cervix, leaving a small plug in the upper part of the vagina. Where the entire uterus is removed he packs the vagina with gauze from above and stitches the peritoneum over it. The mucous membrane of the stump is then cauterized with the Paquelin cautery or with carbolic acid, and drainage provided for by passing a plug of gauze through the canal into the vagina. The peritoneum is then sewed over the stump. As to the operation recommended by Dr. Baldy in inflammatory cases, he believed that there are many patients suffering from puerperal sepsis in whom the removal of the uterus is clearly indicated. In some cases where the disease involved only one side of the pelvis he has removed a portion of the uterine wall and stitched it up with catgut sutures.

Dr. R. B. Maury, of Memphis, Tenn., having taken the chair, Dr. McMurtry discussed the papers.

Dr. McMurtry said that it was the opinion until recently that these tumors did no harm, that they would disappear at the menopause; but the profession now accepts the views of gynecologists who insisted that these growths are of very grave surgical importance. He pointed out the danger and impossibility of comparing the operations of Dr. Edebohls and Dr.

Baldy, or any other two men, for every operator is influenced by the school of surgery of which he is a disciple, and each can operate better according to his method than by any other. It is fatal to fix hard-and-fast rules for performing these operations. We should never determine beforehand to perform some particular operation and insist upon carrying out our predetermined plans, for we cannot tell what difficulties and dangers we may meet which will modify the conditions. He stated that he had never done the abdominal operation for small uterine myomata to which Dr. Edebohls had alluded, for he did not believe that, as a general rule, they should be dealt with surgically, unless they are giving trouble. In the African race these growths are very common, and often do not give any trouble at all. But where an operation is indicated, and the patient can withstand a prolonged operation, he believed that the appendages should be removed. In skilled hands the mortality for removal of the appendages is less than two and a half per cent, and he was surprised to hear Dr. Baldy allude to it in such a deprecatory way. The great danger in abdominal hysterectomy is from hemorrhage —hemorrhage before the operation from the tumor itself, hemorrhage during the operation, and secondary hemorrhage—and the selection of the method of operating must be determined by these factors. As to the operation itself, in those cases where the tumor can be mapped out and moved around you open the vagina and find no adhesions, and as a rule it is a simple operation. In his operations he includes the broad ligament, tubes, and ovaries in the clamp, divides the peritoneum and strips it down, then the stump is fixed in the lower angle of the wound with the peritoneum thoroughly closed behind it. Passing to the consideration of more difficult cases, you open the abdomen and find the tumor up in the folds of the broad ligament, fixed and anchored in the pelvis, and very difficult to move. The operation by the clamp method or by the serre-neud can be done in the shortest time and you have better chances of getting good results. In the ligature operation there is more work to do and you must leave the ligatures in the abdomen. There is one point about Dr. Edebohls' operation which he thought was open to criticism—viz., that the strong arrangement of the pelvic floor requires a great deal of time, which is an element of danger to the patient. He thought Dr. Baldy's operation had been done an injustice in the discussions, because those who saw the operation in its early days remember a big sloughing mass. There is no such picture presented as the operation is done now; there is nothing but a small, dry stump, dusted with iodoform, which shrivels up and comes away in good time. He believed that in the operations of Drs. Edebohls and Marcy, as well as in Dr. Baldy's, drainage is essential. As to the results of these operations, six years ago he had operated on a lady, 35 years of age, for a very large uterine fibroid, and

to-day she is in perfect health. She has no hernia, the cicatrix is small, she is active, well formed, and a good wife and mother.

Dr. Hannah T. Croasdale, of Philadelphia, Pa., said she had been called upon to operate within the last year for a myo-fibroma of the uterus about the size of an orange, and being so small she supposed the hemorrhage would cease after the removal of the ovaries, but the patient began to menstruate freely again and lost much blood every month. She had removed the appendages from another patient, aged 20 years, for the relief of menorrhagia and metrorrhagia, but the operation was unsuccessful as far as a cure was concerned, and she had been compelled to perform a supravaginal hysterectomy. In her experience the results of removal of the appendages for myo-fibroma were not always good so far as the cessation of the hemorrhages was concerned.

Dr. Joseph Taber Johnson, of Washington, D. C., had operated twenty-two times for the removal of the appendages for the arrest of fibroid growths and for the stoppage of hemorrhage. In one case the hemorrhages continued after the removal of the ovary and tube of one side, and in one or two cases there had been a polypus within the uterus, following the removal of which the condition improved.

Dr. Gardiner, of Montreal, Canada, said he had performed all the operations mentioned by the various speakers with a fair measure of success. He had had one or two failures in his operations of removal of the appendages for the relief of hemorrhage. He believed in operating for small tumors, and had done Dr. Edebohls' operation and thought it a most excellent one. He thought it would be better for our patients to dilate the uterus before removing the appendages for the relief of hemorrhage, in order to see if it be not due to a polypus, and he would then curette the uterus before proceeding to more serious operations.

Dr. Edebohls, in closing the discussion on his paper, said there were one or two points in regard to the technique which he wished to speak of. Some operators think they must cut the vaginal mucous membrane from below, circumcising the cervix, but this is not at all necessary; simply packing the vagina with gauze is enough. An error in diagnosis may have been made, the removal of the uterus may prove to be unnecessary, or you may wish to change your technique after the operation is fairly under way, when less harm is done if the vagina has not been opened. Asepsis is altogether a matter of careful preparation and attention to details, and whenever we open the abdomen and are not sure we are going to do a total extirpation we should have the uterine cavity absolutely aseptic. The time spent in curettage of the uterus and cleaning the vagina thoroughly will be time well spent. Then, again, thorough distention of the vagina with gauze makes it very much easier to ligate the uterine

arteries securely, a point for counter-pressure being afforded by the gauze. The uterine arteries should be ligated *en masse*, and, lastly, a running Lembert suture of the peritoneum should close the opening left after the removal of the uterus. Another important consideration was the simplicity of the instruments and technique. No clamp is required, and the instruments are few and simple. He wished to correct a wrong impression which Dr. McMurtry seemed to have received in regard to the size of the tumors for which he operated; he (Dr. McMurtry) seemed to think they were about the size of hazelnuts, whereas the smallest one he had removed weighed three and a half pounds.

Dr. Baldy, in closing the debate on his paper, said that to determine the relative merits of the two operations—total extirpation, and the supravaginal amputation with the intrapelvic treatment of the stump—it is necessary to consider all the dangers incident to a hysterectomy. These were chiefly sepsis, hemorrhage, and shock. In the total extirpation the additional element of shortening the vagina must be taken seriously into consideration. This, everything being equal, is a very strong argument against total extirpation. Shock is frequently dependent upon a prolonged etherization and an extensive manipulation; and as amputation with intrapelvic treatment of the stump can be done in about half the time required by total extirpation, the danger of shock is very much less. As to sepsis the opening of the vaginal vault and the consequent exposure of the pelvic connective tissue make the chances of septic infection infinitely greater than if the cervix be simply amputated, as here the only chance of sepsis is through the small cervical canal. The chances of hemorrhage are also less in amputation than in the extensive tearing of the connective tissue necessary in total extirpation. He could see no objection to the presence of the small bit of the cervix left after amputation, provided, of course, that malignancy be not present; while the shortening of the vagina, involved in total extirpation, is a decidedly serious matter, especially in married women. The extraperitoneal treatment of the stump with a wire clamp is a good and safe operation for those who have not had sufficient experience to perform the other operation, but in the hands of a specialist he thought we had probably heard the last of it.

Dr. Boldt said he wished to make one correction in regard to the use of gauze packing and drainage. In total extirpation no drainage is required. The main feature of the operation is that no drainage is used; there is nothing to drain.

Dr. G. Betton Massey, of Philadelphia, Pa., read the next paper, entitled

A PLEA FOR THE VALUE OF EARLY DIAGNOSIS AND PROMPT ELECTRICAL TREATMENT OF FIBROID TUMORS OF THE UTERUS.

A fibroid of the uterus was almost like a foreign body in the

pelvis, hence it excited symptoms in its early stages and should receive appropriate early treatment. Ovarian disease was often immediately dependent upon such a process. The existence of this condition was sometimes revealed at a very early period by the use of electricity, and might be cured at an early stage by such means. But in many cases the disease could not be thus made out and the process was far advanced before it was discovered. It was not always essential that strong currents of electricity should be used in treating this condition. The author had treated many cases for periods ranging from a year to six years. He believed that all the patients had been benefited and some had been cured. If a tumor had existed a long time, especially if it had become cystic or had suffered inflammatory changes, electricity was not indicated.

Second Day, September 6th—Afternoon Session.

The first paper read at the afternoon session was entitled

THE RESULTS OF VAGINAL HYSTERECTOMY,

by Dr. Andrew J. McCosh, of New York. Four years should elapse after an operation for cancer before a patient could be considered cured. Even after such an interval recurrence might take place, though rarely. If infiltration into the broad ligaments had occurred, radical treatment was out of the question, as a rule. If the uterus was twice as large as the normal unimpregnated organ, the vaginal operation was impracticable. There could be no fixed plan for the treatment of all cases. To secure the broad ligaments the author preferred ligatures to clamps, but the latter were sometimes required in emergencies. Fine silk was preferred to catgut as a ligature material. If the disease was very extensive a high cervical amputation and cauterization were indicated, but only as a palliative. The sacral operation was not favored. For prolapse of the uterus plastic operations would usually suffice, but exceptionally hysterectomy was indicated. Even if hysterectomy was performed the vagina would usually protrude again in from three to six months unless plastic operations were also performed. If prolapse recurred an abdominal section might be made and the vagina be drawn upward and attached to the abdominal parietes. The hemorrhage from the vagina was often troublesome when the uterus was removed for prolapse.

Dr. E. E. Montgomery, of Philadelphia, Pa., read the next paper, the subject being

VAGINAL HYSTERECTOMY.[1]

The Chairman invited Dr. Howard A. Kelly, of Baltimore, Md., to open the discussion on this paper.

[1] See original article, p. 611.

Dr. Kelly said that a great difficulty to be contended against in cancer cases is in securing the patients at an earlier period in their history. He had been insisting upon this in his lectures for the past four years, and he would like to see the adoption of some means for obviating it. To this end he would insist: Firstly, that all women who have borne children should return to their physician within six months after the delivery for an exact inventory of the condition of the pelvic organs, when the physician must state in a written record the lesions and their extent produced by the confinement. Secondly, cervical lacerations should be carefully described. Thick, infiltrated lips associated with cervical catarrh call for depletory treatment followed by repair of the laceration. Thirdly, every woman who has passed 35 years of age and has borne a child should have this examination made without delay, and if the lips are not perfectly sound she should be examined at intervals of from six to eight months. Fourthly, every woman over 35 with a cervical tear should be examined at least once a year for ten years or longer, if the appearance is not perfectly healthy. Fifthly, this applies with redoubled force to patients whose family history shows a marked inclination to cancerous diseases. He thought that the future for gynecologists was clearly in the direction of prophylaxis and anticipation, in either preventing or discovering the malady in its earliest stages, and that the vast majority of cancerous uteri develop upon infiltrated, lacerated cervices.

Total vaginal hysterectomy is now one of the safest and most satisfactory major gynecological operations, and the mortality in favorable cases should be almost *nil*. His own method of operating is, briefly, this: After curetting away the manifest disease and cleansing the vagina thoroughly, stout ligatures are passed through both lips of the cervix, three or four in number, and tied tightly, thus closing the uterus and preventing the escape of any of its septic contents over the wound during the operation. The cervix is then ringed with a knife, cutting through the vagina and freeing the cervix from the vault. Both broad ligaments are now tied off below, using two or three stout silk ligatures, each time cutting between the ligature and the cervix until the uterine arteries are tied. The operation is then continued all the way up one broad ligament until it is entirely severed from the uterus, which is now delivered through the vaginal vault and brought entirely outside the vulva. It is now an easy matter to ligate the other broad ligament from above downward, if necessary giving the disease below a wide berth.

Dr. Charles P. Noble, of Philadelphia, Pa., said he was not an advocate of hysterectomy for prolapse. It is extremely rare to find a patient on whom it is necessary to do hysterectomy to cure prolapse, although there are cases where it is justifiable. His method of treating ordinary cases is to cut off an inch or an

inch and a half of the cervix; the mucous membrane of the vagina is sewed to the cervix, making its mucous membrane continuous with that of the cervix; then he does Stolz's operation on the anterior wall, if there is a cystocele; then the pelvic floor is restored by Emmet's operation. In all the cases on which he had operated—perhaps thirty—he had yet to see a case where the uterus has come down. He had recently operated on two cases where he did not expect to get a cure, and in these cases the prolapse will probably recur. In a woman with reasonably thin abdominal walls he thought the addition of ventral fixation to the plastic work would give the best results. Even when hysterectomy is done we have to perform a plastic operation afterward, and he thought it better to do it all in one operation. In performing vaginal hysterectomy he always stitched the broad ligaments to the vagina to act as guy ropes, but these guys will stretch in time if the pelvic floor is not restored.

Dr. George M. Edebohls, of New York, did not believe that vaginal hysterectomy for complete prolapse of the uterus and vagina was ever necessary except in one of two conditions: first, where the condition of the uterus is such that a neoplasm is suspected; and, secondly, where the uterus itself, both cervix and body, is so large that it is not possible to reduce it to approximately its normal size by amputation of the cervix. He believed it possible to cure all other cases without resorting to so serious an operation, either by doing ventral fixation of the uterus alone, or by combining it with the needed plastic operations, doing everything at one sitting. He had had three cases of total extirpation for prolapse, but removal of the uterus alone was not sufficient to cure the condition; he had to narrow the vagina and close the perineum at the same sitting. Ventral fixation of the uterus is a much less dangerous operation than hysterectomy. It is just as easy to do in fat women as in lean ones, and there is no danger of hernia if a buried permanent suture be used to unite peritoneum, muscle, and fascia to each other.

Dr. Andrew F. Currier, of New York, believed that there is but one operation for cancer of the uterus, and that is complete removal. He would not discuss the question of hysterectomy for prolapse, as he coincided entirely with the views expressed by Dr. Noble and Dr. Edebohls. There are several important points to be considered in regard to hysterectomy for cancer. When extirpation by the vagina has been decided upon, if the disease is in the cervix and is extensive, the best plan is to curette out the uterus preliminary to the operation for removal. He allowed a week to elapse and then finished the operation. He had expected Dr. Kelly to refer to the danger of ligation of the ureters, and he thought every one should familiarize himself with the catheterization of the ureters to

prevent such an accident. The operator should not consider his connection with a cancer case ended when he had closed the peritoneum and seen the patient put to bed, for it is often through the neglect of operators that the disease recurs. He fully indorsed Dr. Kelly's remarks on the necessity of constant and long-continued surveillance of cancer cases. In the actual cautery we have an instrument of great value in preventing the recurrence of the disease. We should remove the cancer with the knife, and at the first reappearance of the disease use the cautery; we may in this way save many lives.

Dr. J. M. Baldy, of Philadelphia, Pa., said that he had found from personal experience that hysterectomy by the clamp method was much harder and more dangerous than by the use of the ligature. Two out of the three deaths which had followed his operations for vaginal hysterectomy had been from the use of the clamp. On the question of hysterectomy for prolapse he expressed himself as at variance with most of the gentlemen who had spoken. He believed that women near or past the menopause are proper subjects for hysterectomy, and he would have no hesitation in doing that operation for prolapse on such patients. Dr. Baldy adopted hysterectomy instead of hysterorrhaphy, and the testimony of several previous speakers that the mortality should be almost *nil* agreed with his. In hysterorrhaphy we take all the risks of hysterectomy, and, moreover, leave behind a large mass which may undergo cancerous degeneration, and which, by its weight alone, may reproduce the condition of prolapse. The question is, Can you get some support for the vagina above after the uterus has been removed? Bringing down the stumps of the broad ligaments into the vault of the vagina and stitching them to the vaginal walls, they act as guy ropes and with certainty hold the vaginal vault well up in the pelvis. It is well to do a plastic operation afterward, and we may wait two, three, or four weeks before doing it. It is simply a question of mortality between vaginal hysterectomy and hysterorrhaphy; the hysterectomy could be performed as rapidly as the hysterorrhaphy, if done by a competent operator.

Dr. McCosh, in closing the discussion on his paper, said that the question of the relative merits of silk and catgut enters into every branch of surgery, and that there are as many advocates of the one as of the other. He found, however, that most of the men who have tried both are coming back to the use of silk. If heavy silk is used in tying the broad ligaments trouble will ensue, but if fine silk be used no danger need be apprehended. Dr. Montgomery says that a week before he operates for vaginal hysterectomy he cleans out and curettes the uterus, but the speaker thought this could be done just as well at the time of the operation. Dr. Kelly had said that it was easier to cut off one side and then ligate and cut off the other, but Dr. McCosh believed that this would be attended by a greater loss of blood

than the other method. He defended the use of iodoform-gauze packing. The attempt to draw up the vagina by stitching it to the broad ligaments must, as a rule, result in failure, as the ligaments have been drawn down and stretched by the weight of the hypertrophied uterus.

Dr. Montgomery, in closing the discussion on his paper, said he fully agreed with Dr. Noble and Dr. Edebohls in regard to the infrequency with which the operation of hysterectomy should be done for prolapse of the uterus. He had never done the operation for that condition; he had simply mentioned it in his paper as a possible indication. As to the use of the clamp or ligature, the majority of his operations had been done with the clamp. The advantage of the clamp over the ligature is the greater rapidity with which the operation can be performed. He had done the operation by their use in ten minutes, while he did not believe he could accomplish it and ligate the broad ligament inside of thirty minutes.

(To be continued.)

SECTION ON OBSTETRICS.

The Executive President, Giles S. Mitchell, M.D., *of Cincinnati, in the Chair.*

The Section was called to order at 3 P.M. by the Executive President, Dr. Mitchell, who proceeded to read his

ADDRESS OF WELCOME.[1]

Dr. John O. Polak, of New York, read the first paper, entitled

THE HEMORRHAGES OF PREGNANCY: THEIR MANAGEMENT.

Hemorrhages occurring during pregnancy were either ante- or post-partum. The former were: hemorrhage as a symptom of miscarriage, placenta previa, accidental hemorrhage from partial separation of a normally placed placenta, and extra-uterine pregnancy; hemorrhage due to rupture of the uterus and ectopic pregnancy were not considered in this paper. Post-partum bleeding occurred in atonicity of the uterus and lacerations.

The measures which Dr. Polak resorted to for the control of slight hemorrhage which pointed to danger of miscarriage had been rest in bed, suppositories of morphia and atropia, and fluid or solid extract of viburnum. These simple measures had proven sufficient in many cases. In more severe cases, in which

[1] See p. 663.

abortion was inevitable, he would tampon the cervix and vagina, empty the uterus, and bring about firm contraction. Speaking more in detail of the management of such a case, he would first empty the bladder and rectum, put the patient in Sims' position, douche with a two-per-cent solution of creolin, then fix the anterior lip of the cervix, introduce strips of iodoform gauze into the canal, pack well, finally pack against the os, and fill the vagina with the gauze. If the bleeding were marked he would proceed to dilate rapidly by instruments.

In placenta previa the hemorrhage was from the uterine sinuses exposed by the separation of the placenta, or from the placenta itself. The treatment would depend somewhat upon the period of pregnancy, whether the child were or were not yet viable. In any case, however, he believed the uterus should be emptied with the occurrence of the first bleeding, in order that the patient's strength might not be wasted by loss of blood and nervous strain. If the cervix were closed, and the case were not too urgent, tampon with iodoform gauze, remove in eight to ten hours, and douche with an antiseptic. If the cervix would admit one or two fingers—and it usually would—turn by the Braxton Hicks method and bring down a foot. The Braxton Hicks method was of advantage in three ways: it permitted of turning when but one or two fingers could be introduced; by rupture of the membranes further separation of the placenta was prevented; the breech acted as a natural antiseptic tampon, controlling hemorrhage.

The author referred to three cases in which he had incised the undilatable cervix, performed version, extracted the child, and tamponed. Regarding the use of ergot, Dr. Polak condemned its employment before emptying the uterus. For checking bleeding post partum he had used it subcutaneously three hundred and twenty-one times without causing an abscess.

A COMPARISON BETWEEN THE AMERICAN AND EUROPEAN PELVIS, WITH PRACTICAL CONSEQUENCES ARISING FROM THE PECULIAR MEXICAN PELVIS.

Dr. Manuel Guiterrez, of the City of Mexico, summed up the conclusions of a paper on this subject in Spanish as follows: 1. The Mexican pelvis is characterized by a general reduction in its diameters, the more remarkable as they approach the perineal floor; by the great elevation of the pubic symphysis; by the great inclination of the excavation and of the straits; by the great extension of the perineum; and by the straightness and direction of the vulva. 2. The consequences of this configuration are: (*a*) some difficulties in ectatic accommodation; (*b*) the peculiar manner of practising vaginal touch; (*c*) a certain tendency to facial presentation during the maximum of parturition; (*d*) this is sometimes slow and made painful by difficult

movement of descent, rotation, and extension of the head, and the accidents caused by the remaining of the ovoid in the vaginal canal. 4. These difficulties are sometimes manageable, but they require the intervention of art. 5. The conformation and diminution of the floor and pelvic outlet expose the perineum to great danger.

A STUDY OF PLACENTA PREVIA, ESPECIALLY THE CAUSES OF THE HEMORRHAGES.

Dr. Sarah Hackett Stevenson, of Chicago, Ill., read a paper bearing the above title. She said that during the past ten years she had been teaching theories regarding placenta previa which had not yet found their way into text books or literature except in one instance. All are agreed that the relation between the uterus and the placenta is disturbed; that the so-called utero-placental vessels are ruptured and blood escapes. But all are not agreed as to the factors which enter into the disturbed relation between uterus and placenta, nor as to the source of the hemorrhage. Dr. Stevenson regarded the extravascular development in the lower segment of the uterus as the source of danger. The arterial blood reaches the placental site in opposition to gravity in ordinary cases, while in previa it is in the line of gravity, the vessels in the neck being in a vertical direction, while in the body they take a horizontal course. Then, too, when uterine contraction takes place the blood is driven out from the fundus into the vessels of the neck, thus still further dilating them, so that when rupture takes place, as it must do some time, it is almost like tapping the aorta, the hemorrhage is so great. The scarcity of muscular fibres in the lower segment tends still further to render the veins in this locality diverticuli for the blood forced down by gravity and muscular contraction from above. Other factors may enter into the problem, but they are not constant.

Dr. Fernando Zórraga, of the City of Mexico, read a paper, in Spanish, on

THE BLOOD IN PREGNANCY.

The Secretary, Dr. Hugh Hamilton, of Harrisburg, read a paper entitled

THE APPLICATION OF GRAPHICS TO THE FETAL HEART SOUNDS.[1]

The papers read during the afternoon were discussed collectively.

Dr. de Saussure, of Charleston, inquired of Dr. Guiterrez whether the cranial diameters of the Mexican fetus did not differ from those of the European, and thus render dystocia less

[1] See original article, p. 685.

marked than one would anticipate from the peculiar conformation of the Mexican pelvis.

Dr. Guiterrez responded in the negative.

Dr. Guiterrez took issue with Dr. Polak with regard to the propriety of incising the undilated cervix in order to effect prompt delivery in placenta previa, and said that in Mexico they were generally opposed to it on account of the danger of hemorrhage.

Dr. Harris, of Paterson, N. J., said he knew of a case where a surgeon was called who was acquainted with the work of those who had incised the cervix, and who refused to resort to this procedure in a case of placenta previa, and performed Cesarean section as the safer operation.

Dr. Dewees, of Kansas, had seen thirteen cases in which there was every indication, as far as these had been mentioned, for cutting the os, but he had avoided it by one or more of three measures—viz., the use of hot water, venesection, or chloroform. He was asked whether there was not danger of postpartum hemorrhage following the use of chloroform. His reply was that he had not observed that danger. Moreover, it was said to be less imminent in anemic women, and in plethoric patients he had used the lancet. The dilatation of the cervix was almost immediate after the withdrawal of, say, thirty ounces of blood. In eclampsia he had taken as much as fifty ounces.

Dr. Zárraga inquired of the members whether in asphyxia of the newly-born they had observed greater or less frequency of the heart beat. European and American authors generally stated that there was diminished heart beat and circulation, while the contrary had been observed in Mexico.

THE STATUS OF OBSTETRICS IN GENERAL PRACTICE.

Dr. Eliza H. Root, of Chicago, read this paper. It was largely a plea for better preparation on the part of the young physician when about to enter on general practice and that of midwifery. The conditions which prompted the patient to seek the advice of the gynecologist were largely preventable and belonged to one of two classes of causes, or to both combined—viz., traumatisms and inflammations. Passing to the subject of inflammations, these were largely due to septic infection, and, like traumatisms, could be traced to ignorant or careless practice on the part of the accoucheur, patient, or her attendant during the lying-in period. Dr. Root thought that in this country graduates were permitted to commence the practice of obstetrics without the necessary clinical experience with the steps of labor, the use of forceps, and other methods of artificial labor. Then, too, carelessness and ignorance on the part of the patient and

friends frequently put the skill of the physician to a severe test. Often the doctor was not called before pregnancy was well advanced, and complications had arisen which might have been prevented. Thus nephritis might go on and lead to eclampsia before the physician was sent for. One of the most constant conditions allowed to continue until toxic or other evil results followed was constipation. She would impress upon the physician the importance of having patients seek timely advice, and of warning them against those habits or conditions which were liable to prejudice a favorable termination of pregnancy. There was too much tendency, she said, to measure one's success by the mortality rate, and to overlook the miseries arising from traumatisms and inflammations which might have been prevented. Look to the sick list, and the death rate would take care of itself.

Under no circumstances could the obstetrician do careless or indifferent work. Dr. Root alluded to that class of midwives in cities who advertised in the daily papers, and who made a custom of producing abortion for a fee. It was the duty of the profession to aid in stamping out this vice. The last division of her subject impressed the necessity for care during several days following delivery. No circumstance of poverty should lead the physician to limit his subsequent attention to one visit.

THE INDUCTION OF PREMATURE LABOR.

Dr. J. H. W. Chestnut, of Philadelphia, Pa., read a paper with this title.

The groups of cases whose circumstances may call for the operation for the induction of premature labor include, first, cases of contracted pelves which would render labor at term dangerously difficult to the mother, to the child, or to both; second, cases of maternal disease which progressively endanger the life of the mother; third, cases in which in previous pregnancies the child has died in the latter weeks of gestation; fourth, cases of hopeless disease of the mother for the sake of the child; fifth, cases in which the child is known to be dead; and, sixth, cases complicated by the presence of ovarian, bony, or malignant tumor, or by atresia of any part of the normally distensible canal.

The relative number of markedly contracted deformed pelves is very small; in a private obstetrical practice of more than twenty years, averaging from sixteen to twenty cases per month for many years, the writer has met but one case with a conjugate diameter at the brim of less than two and one-half inches; but cases of lesser contraction, where the same diameter measured from three to three and three-fourths inches, or where there appeared to be a slight degree of lessening in all diameters, were not so uncommon.

In view of considerations set forth in the paper, and of the results of cases therein reported, the writer believes that in cases of deformed pelves where the antero-posterior diameter at the brim is from two and three-fourths inches to three and one-fourth inches, and in cases of justo-minor pelves where the same diameter is three and one-half inches, labor should be induced before term, when the conditions described are recognized in due time. The difficulty of diagnosis at the proper time is the obstacle to the more frequent employment of the operation in these cases. The means used to reach a correct diagnosis include the history of the patient, inspection, and various external and internal measurements, as set forth in the paper.

In the other groups of cases submitted no difficulty of diagnosis is supposed; and the decision as to the advisability of the operation depends on a comparison of the possible results of prospective conditions and measures.

To appreciate the advantages of induction of premature labor it was necessary to review the operative measures which might have to be selected at term; and it would be found that, however useful they might be, they would not be without drawbacks. Forceps and version had their place. Cesarean section, notwithstanding its improvement, was still a formidable operation, fraught with great danger to both mother and child. The same criticism applied to laparo-elytrotomy.

Dr. Chestnut thought that, as far as symphysiotomy was concerned, it was frequently attended with hemorrhage and the symphysis was permanently impaired. The physician should make pelvic examination his custom when requested to take charge of a case. He should inquire as to the previous physical condition of the woman, her general development, whether the abdomen was unduly pendulous, make external examination of the pelvis, and, if possible, vaginal examination. It was his firm conviction that in the hands of the general practitioner the induction of premature labor was the best procedure in the management of cases where the pelvis was contracted within the limits before named. Exceptional experience and exceptional skill might be a law unto itself.

Dr. Sarah Stevenson emphasized the position of Dr. Root, that the practice of obstetrics should not be permitted in this country by the ignorant. Only two persons should be permitted to enter the lying-in room—the skilled physician and the trained nurse. This was possible, at least in all large cities. We should, at any rate, throw our influence against the licensing of ignorant midwives.

Dr. Upshur, of Richmond, wished that a copy of the paper read by Dr. Root could be hung up in the office of every young physician and of many older ones. He was sure that one of

the evils of the day was carelessness in the management of midwifery cases. Personally, when asked to attend a case, he always inquired as to the previous condition of the woman—whether primipara, as to general health, dyspneal troubles, previous menstrual flow, habits, sleep, exercise, constipation, puffiness of face and ankles, etc. Down in his section of the country physicians frequently attended families for two or more generations, and it was their duty to guard the health of the girl as she was developing. One of the greatest difficulties which they had to encounter in the South was to impress the necessity of cleanliness upon negroes. He was sorry to make the charge, as it was a very serious one, yet it was true that many physicians, for want of time, often hurried normal labor up. He thought there was too much tendency to routine in obstetric practice—for instance, using the vaginal douche in every case, regardless of conditions. In some of the Southern States anybody could obtain license to practise midwifery, and there would always be some persons who would employ them, no matter how great their ignorance, simply because their charge was low. Primiparæ were apt to look forward to labor with great anxiety, and perhaps, through nervousness, even precipitate a convulsion. It was the duty of the physician to quiet the fears of such patients.

Dr. Guiterrez, of Mexico, said that in his country they had attempted to regulate midwifery, but their first efforts had failed on account of the ignorance of the applicants for license. It was now proposed to establish an educational course divided into two periods, three and two years, making in all a five-year term.

RESOLUTIONS.

Dr. Hugh Hamilton offered some resolutions, which were referred to a committee to be reported upon the next day. When modified by the committee and adopted by the Section they read as follows:

Resolved, That the Section on Obstetrics of the Pan-American Medical Congress protests against the irregular practice of obstetrics by midwives, and that, in view of the great danger to the community incident thereto, recommends that the boards of health or licensing boards of various States refuse to grant license to applicants to practise midwifery who have not received technical instruction and preliminary training for at least one year in competent schools and passed an examination in obstetrics equal to that required of applicants for the degree of medicine.

Resolved, That copies of these resolutions be sent to the licensing boards of health of the several States.

AIDS TO EASY PARTURITION.

Dr. A. J. C. Saunier, of Chicago, Ill., read a paper on this

topic. The points which he should mention might seem minor in themselves, but taken collectively were likely to make a great difference in the ease of parturition and in lessening the woman's suffering. If the physician had opportunity he should recommend their commencement early in life. The mother should be warned against such habits as would undermine the general health of her daughters, especially such as favored pelvic disease, like overlifting, constipation, habitual retention of urine, sedentary habits, wearing tightly laced dresses. Regarding the latter point, Dr. Saunier said that a well-secured, easy corset was less injurious than a tight dress dragging upon the waist. Care should be exercised by young women at the time of menstruation to prevent undue congestion and secure free catamenial flow.

Pregnancy having taken place, attention should be given to diet. The child's food must be of what the mother partook. Therefore the condition of the child's bones could be controlled by feeding as easily as a person could be fatted or reduced in adipose tissue by regulating the diet. The object was to avoid too great development of the bony system, which would interfere with the moulding of the head and easy passage of the child through the parturient canal. Those foods containing earthy salts in large proportion should be avoided—oatmeal, Graham bread, other cereals, and all things containing large quantities of earthy phosphates; use white bread, potatoes, most kinds of vegetables, and especially fruits. The latter would keep the bowels free and cause solution of the earthy salts in other articles so that they could be carried off by the kidneys. He said he had often seen softer, more cartilaginous bones in the child when the mother had been fed largely on acid fruits.

All pelvic troubles, especially those of an inflammatory nature, should be corrected during gestation.

The physician should cultivate the use of an occasional vaginal douche and the bath. Hot hip baths and douches, and hot cloths applied to the perineum, during the last week, helped to ease the passage of the child. The water should be hot, not warm—at least 118° F.—and continued a long time. One means of abridging the first stage was gentle massage of the abdomen, which at intervals might be kept up throughout labor. Again, the first stage might be shortened by encouraging dilatation with the finger, which need not be removed from the vagina for perhaps half an hour, thus avoiding possible infection from frequent reintroduction. Belladonna or atropia ointment applied to the os, or a hypodermic of opium, would lessen the pain and favor dilatation. Some cocaine in suppository introduced into the vagina was very pleasant to the patient.

Dr. Chestnut, of Philadelphia, Pa., said that the teachings of

the paper were in some respects different from those which he had recommended. It was desirable that the labor should be easy, but it might be questioned whether it should always be rapid. As to diet, granting the possibility of softening the bones of the child, he doubted if it would be a justifiable procedure. Would not a child born with soft bones be ill-prepared to withstand the hardships of life? And would it not be difficult to rectify the deficient development through the food of the mother after birth?

Dr. Saunier said he had applied this method of feeding the past twelve years, and had not observed that it produced osteomalacia or other ill condition in the child.

Dr. Upshur, of Richmond, had observed persons, living upon such food as Dr. Saunier had recommended, suffer from increased caries of the teeth because deprived of phosphates or earthy elements. He had seen women relieved of great suffering from pain in the teeth—the teeth perhaps being apparently sound—by the hypophosphite of lime or some such preparation. He also asked Dr. Saunier whether he had observed cocaine poisoning. Very small doses of cocaine in the nose often produced alarming symptoms.

Dr. Saunier had not observed symptoms of poisoning from the use of cocaine in the vagina, even in large doses. Nor had he observed any ill effects of this form of diet upon the mother. After the birth of the child she was again given such food as contained earthy salts.

THE MECHANISM OF LABOR.

Dr. Jacob Chase Rutherford, of Providence, R. I., attempted in this paper to prove that the theory of the mechanism of labor advanced by ancient and many modern obstetrical writers was erroneous. He asserted that the pelvic canal was angular, not curved. It was made up of two axes, the axis of the uterus and that of the vagina, which, where they crossed each other, formed an angle of about ninety-five degrees. He said that the outer or vaginal angle performed a very important part in the mechanism of labor. It was necessary to have a correct idea of the mechanism of rotation in order to have a correct one of the mechanism of labor. Assuming knowledge of this subject on the part of the reader, he outlined the mechanism of labor as follows, which, he said, went to prove his position that the parturient canal was angular and not curved:

In head presentations, occipito-anterior, the head descends in the axis of the uterus in a straight line until it reaches the trough of the levator ani muscle, when rotation begins; continuing to descend in the same line, it reaches the bottom of the trough, which is the floor of the pelvis. By this time rotation is completed, and now begins the hardest part of the labor, for the head, having reached the floor of the pelvis, cannot go any

further, but must change its direction and pursue a course at right angles with the one it has been following. This change in direction is brought about by extension of the head into the vaginal canal. As the head extends the body descends, and by the time the head is fully extended it has passed the vaginal orifice and the shoulders are at the utero-vaginal angle. They pass the angle by a lateral bending of the body and are followed by the hips and legs.

In occipito-posterior cases labor is prolonged by the impossibility of further flexing an already fully flexed head, and the perineum has to be enormously distended before the head can be delivered.

In face cases mento-posterior delivery is impossible, because the head cannot be further extended, and the stiff, straight fetal body cannot be bent around the angle.

A knowledge of the mechanism of head cases embraces a knowledge of the mechanism of other presentations.

The deductions to be drawn from the above theory are: first, the parturient canal is angular, not curved; second, when the presenting part has reached the bottom of the trough in the pelvic floor, rotation is complete; third, flexion and extension take place at the utero-vaginal angle; fourth, in the high forceps delivery traction should be made in the line of the uterine axis, and, in the low forceps delivery, in the line of the vaginal axis.

OBSTETRICS AMONG THE NEGROES OF SOUTH CAROLINA.

Dr. P. Gourdin de Saussure, of Charleston, in his opening remarks stated that it was very difficult to obtain exact statistics among negroes because of the indifference which they showed as to time and figures. Everything with them was "about," and a difference of five or ten years in age was regarded as of little importance. Notwithstanding the difficulties experienced in collecting the statistics which he had to cite, they could be relied upon where no modifying term was used. They were founded upon private and dispensary practice and upon the reports of the Health Board of Charleston.

Menstrual life began at the age of 13.1—at least a year earlier than the age given by Emmet. Negroes were not virtuous, and therefore matured early. The average age for the menopause was 48.8, and he had delivered some women who said their age was 53. Amenorrhea, dysmenorrhea, and hemorrhages were extremely rare. He had seen but three negroes who had been compelled to give up their occupation on account of hemorrhages, and then the cause had been anatomical. They were more fruitful than whites, the average number of children to the family being 6.8. For several years past the negroes had been shirking their responsibility, taking means to prevent the increase of family, and he thought that within five years more

the average number of children would be less than six to the family.

With the negro, pregnancy was physiological, not pathological. Eclampsia was not unusual, and was to be explained perhaps by poverty and anemia, or else by the imitation of so-called civilized habits of the whites. The bringing-on of abortion before the fifth month was becoming very common, and was done, not by instruments, but by drugs. Neither doctor nor midwife was called when the abortion was not later than the fifth month. Notwithstanding the great frequency of abortion, puerperal fever or septicemia was extremely rare. This, he thought, was to be accounted for by the fact that vaginal examination or the use of instruments was almost never employed.

Syphilis was extremely common among the negroes of the South, at least seventy per cent having inherited or acquired the disease. The pelvic diameters were larger than in the whites; labor was a simple act, physicians seldom being called. Midwives attended nine-tenths of the confinements. They never made a vaginal examination, and therefore labor almost always terminated without accident, notwithstanding the very foul surroundings of the patient. Dr. de Saussure had been called to but two cases of post-partum hemorrhage in eighteen years. The scarcity of puerperal fever was shown by the fact that out of 14,358 deliveries there had been but 57 deaths from puerperal fever, including cases of peritonitis; yet the dirt and filth among the negroes were almost inconceivable. These 57 deaths represented about all the cases of puerperal infection. This meant that where no examination was made auto-infection was hardly possible.

THE THERAPEUTIC APPLICATION OF CHLOROFORM IN LABOR.

Dr. J. N. Upshur, of Richmond, read the paper. A long experience with chloroform had led him to question its supposed uniform safety in labor. We are apt to forget that labor was a natural phenomenon except under abnormal conditions. Besides possible after-effects, it was a question whether, when chloroform was used in normal cases, it did not tend to produce some form of dystocia, making interference necessary to deliver the woman.

The following questions naturally arose: In what cases should chloroform be administered? At what stage of labor? What dangers arise in consequence? At what stage do these complications arise? The best means of combating them? Is it justifiable to administer chloroform in natural labor progressing with satisfactory rapidity?

In order to make the subject clear Dr. Upshur ran over the effects of the different stages of chloroform anesthesia. He thought that, at any rate, chloroform ought not to be adminis-

tered before the second period was well established, and it should be withdrawn as soon as the occiput had passed the vulva. As to dangers of chloroform used short of complete anesthesia, he thought it was worthy of investigation whether it might not produce an effect upon the cardiac ganglia which would predispose to hemorrhage or weakness of heart action during convalescence. Moreover, it was difficult to keep the patient at the stage of beginning narcosis. One of the physiological effects of chloroform was to diminish muscular excitability. Therefore the pains were less potent in expelling the child, and when the second stage was completed there was greater danger of hemorrhage because of the incomplete retraction of the uterus. The uterus was left in such a condition as to make subinvolution almost inevitable. Then, too, the spongy condition of the organ rendered the patient much more liable to septic infection. He had known instrumental delivery to be made necessary by chloroform stopping the expulsive effort of the uterus. By interfering with oxidation of the blood it endangered the life of the fetus, and he believed it increased the percentage of still-births. Although there were few cases of death from chloroform reported in practice, yet it was a question whether deaths occurring within twenty-four hours, said to be due to heart clot, etc., might not have been due to chloroform plus the shock of labor.

He would lay down the proposition that whenever chloroform had been used a full dose of ergot should be given as soon as the head escaped. He would also suggest that it would be safe practice to give at the end of the second stage some quinine, belladonna, or nitroglycerin, or a hypodermic of atropine or sulphate of strychnia.

He earnestly avowed his belief that as physicians we should place chloroform upon the same platform as other drugs, and not be influenced by the complaints of the patient; that it be administered, like other agents, only when the indications imperatively demanded it.

A METHOD OF PERFORMING RAPID MANUAL DILATATION OF THE OS UTERI, AND ITS ADVANTAGES IN THE TREATMENT OF PLACENTA PREVIA.

Dr. P. A. Harris, of Paterson, N. J., read this paper. The method consisted in using the index finger, followed by others as dilatation went on, in flexion instead of in extension, as was usually done, for the flexor muscles are much more powerful than the extensors. The thumb is employed for passive pressure against the opposite wall of the cervix, the flexors of this member being also the active agents. Great power could thus be exerted, and the os fully dilated in a short time. In the eight cases of placenta previa in which he had employed it, twenty

minutes was the average time. Delivery was complete in forty minutes. All the mothers were saved. The method is also applicable in all cross-births.

Dr. H. J. Garrigues, of New York, said the method described in Dr. Harris' paper was new to him, although he had practised manual dilatation of the os in placenta previa for many years, and it was the method commonly practised in New York at the present. Thus far it had been the custom to use extensor muscles, but, as there was much greater strength in the flexors, he thought the method described must possess marked advantage.

Dr. R. A. Murray, of New York, said he had been extremely interested in Dr. Harris' paper. His remarks, however, were directed less to the method of manual dilatation than to the general principle of this mode of treatment of placenta previa. He said that in the lying-in institutions of New York the very great reduction of mortality from puerperal sepsis was due to strict cleanliness in all manipulations in these and other cases. If one finger could enter there was no reason why, up to the fifth month, an instrument should not be introduced and the fetus be removed. In lateral implantation it was not necessary to dilate in the later months; but rupture the waters, and the membranes would come down and plug the cervix and stop hemorrhage. It was in central implantation that manual dilatation and extraction were called for.

Dr. Saunier, of Chicago, had frequently found it difficult to reach the os with the end of the finger, and asked Dr. Harris how it was that he could introduce both finger and thumb.

Dr. Harris replied that the hand followed the finger into the vagina. He further stated that he did not resort to this method in normal labor in order to hasten dilatation.

MATERNITY HOSPITALS AND THEIR RESULTS.

Dr. Joseph Price, of Philadelphia, discussed in this paper the improved results of maternity hospitals, and the causes therefor. We had learned the evil results of hurry and want of cleanliness, and had found that the interest of mother and child could no longer be sacrificed to the exigencies of private practice. It was not unsafe to predict that obstetrics would become a specialty and in its ranks would be found the clearest and most scientific men of the profession. The advantage of maternities over the home lying-in chamber was due to the fact that they were under the control of the best men, were cleanly, were not overcrowded, and in them there was less tendency to hasten delivery. Unfortunately, under the present educational system, many of those going out from the schools to practise were ill-equipped for obstetrical work and carried many risks to mother and child. The lessons taught by both gynecological and ob-

stetrical experience were that we had no right to tolerate filth or blunder. Old theories and beliefs had been gradually giving way before the assaults of better facts, and each age found fewer superstitions in medicine and surgery. The trustees of our schools and fraternities held the highest trust existing in a community—a trust which affected the welfare of mother and offspring, a trust which reached every grade of life—and he regretted to say that they had not always exercised it with the best judgment. Yet no better work had been done than in the maternities, especially those of Baltimore, Philadelphia, New York, and Boston. In many of them the mortality from puerperal sepsis had been reduced from about twenty per cent to almost nothing. This had been due to non-interference in normal labor, to prompt aid where art was required, to strict cleanliness and attention to hygiene.

Teachers should not be appointed on account of their pedigree, their family connections, or wealth, but for their knowledge of the subject and their love for teaching. There should be no small men, morally or mentally, in the faculties of our great schools. The work could not be so well done but that it could be done better. With each death the community would become more angry and the demand for better obstetrical teaching would become more imperative.

THE AXIS-TRACTION PRINCIPLE IN OBSTETRICS.

Dr. Joseph Hoffman, of Philadelphia, Pa., said the object of his paper upon this subject was, if possible, to bring into more general prominence a principle which was mechanical and therefore rational. The principle and the instrument presented fulfilled the conditions demanded of a perfect machine. The pelvic axis had been considered by some, as it were, a broken cylinder, by others as a curve; but whether the axis was made up of straight lines or a curved one amounted to nothing in the present instance. Tarnier had estimated that for every thirty pounds of force exerted by the ordinary forceps upon the fetal head to carry it along the canal, twenty-six pounds were lost upon the symphysis. In the instrument presented by Dr. Hoffman he said these figures were reversed. It was desired to make traction in line of the canal, which was first downward and backward, then downward and forward; and in order to accomplish this with the ordinary instrument we were taught to compress and pull on the handle with the left hand and to push upon the shanks with the right, which seemed to him about as practical a procedure as to try to go in two directions at once.

The axis-traction forceps presented by Dr. Hoffman dispensed with the traction rods present in the Tarnier and other instruments, or, rather, these were attached to the blades of the forceps through the medium of tapes or cords. The cords were fastened

to the middle of the blades, the rod in turn was fastened to the cords, and, when pulled upon, traction was necessarily made in the axis of the canal. The rod had a bend almost at right angles, and in accordance with the laws of mechanics the force was exerted in the line of the hypothenuse. Unlike the ordinary forceps, there was no other compression force upon the child's head than resulted from actual traction in the line of the canal. When the perineum was reached the handles of the forceps turned upward over the symphysis, the head was lifted from the perineum, and this structure was actually protected rather than endangered by leaving the instrument on until extraction of the head had been complete. Again, the forceps presented could be used in breech presentations with perfect safety. He showed the forceps which Prof. Winckler had recommended with characteristic German enthusiasm, and said it was objectionable in that it did not make allowance for lateral motion, whereas the instrument with tapes did not interfere in the least with normal rotation and required no training of the hand to accomplish this.

FORCEPS DELIVERY.

Dr. James Campbell, of Hartford, read this paper. He had nothing to say against the use of forceps in proper cases; they had done much to save human life. But the mechanical tendency in some young physicians, and the disposition on the part of some older ones to save time, had led to their abuse, or to their use where not required. To show that his assertions were not without foundation, he cited four cases illustrating different forms of forceps abuse. A young physician, in order to meet another engagement by a certain hour, applied the forceps and hastened delivery where the labor was pursuing a normal course; and although he was enabled to keep his engagement, it was at the cost of perineal and cervical tears and subsequent suffering therefrom on the part of the woman. Extra-conservatism was fraught with as great evil, as was shown by the case where an old physician allowed the woman to remain in labor over two days with final loss of mother and child. Then, too, physicians often made repeated attempts to deliver with forceps when some other procedure alone could prove successful.

A FEW PRACTICAL QUESTIONS CONCERNING THE FORCEPS

Dr. W. Frank Haehnlen, of Philadelphia, Pa., changed the title of his paper from that of the use and abuse of the forceps to that given above. Are we justified in using the forceps for the sole purpose of economizing time? Are we justified in using it in normal labor in hyperesthetic women? Should we apply it before the head is engaged at the superior strait?

Are we justified in making traction regardless of the natural curve? Is compression by the forceps justifiable beyond the degree which secures firm hold of the head? How long should the head be allowed to remain in the vagina, bulging at the perineum? Are oscillatory movements of the forceps allowable?

Briefly stated, his answers were: Forceps should not be used solely for economizing time; they should not be used without good reason. If the woman were hyperesthetic, use anesthesia if necessary. The instrument should not be applied to the head at the superior strait, if movable. Nor did he think forceps should be used in slow labors which otherwise were normal. The blades should be applied to the sides of the head, not obliquely, and it was only when the head was in the anteroposterior position that the blades should be transverse with reference to the mother's pelvis. Traction should be made in the line of the curve through which the fetus had to pass. The conditions of the case would have to determine how long it was safe to leave the head bulging at the perineum. Regarding oscillatory movements of the forceps, he thought that when practised with care they would facilitate delivery without in the least endangering the interests of mother or child.

The discussion on the papers relating to forceps was then taken up.

Dr. H. J. Garrigues said he had not used the instrument presented by Dr. Hoffman, but, in so far as the principle of attaching tapes to the middle of the blades was concerned, it was the most rational. The instrument which he used was Simpson's modification of Tarnier's. He could not say it saved the perineum, for he had more torn perinei where forceps were used than where not, or more than when the old forceps were employed and removed on reaching the floor. But he did not care so much nowadays about a torn perineum, since with cleanliness it could be permanently united with a few stitches applied immediately. The advantage of the axis-traction forceps was shown in the fact that a tyro could do now what an accomplished obstetrician could do with older instruments. The power required was but a fraction of what he formerly had to use, and to a man of advancing years this was a factor of importance. He agreed with Dr. Haehnlen that it was much better to turn and extract, where possible, now that we could observe antisepsis. Regarding low forceps application, he thought that as soon as Nature gave out and failed to do her work we should not wait, but interfere at once. He closed with the advice: Let everybody apply antiseptic midwifery in private practice: let nobody examine a woman without an antiseptic finger.

Dr. Joseph Price indorsed the forceps and the remarks of Dr. Hoffman. The use of other instruments was often equiva-

lent to a criminal assault. No mother should allow her daughter to be attended in confinement by a physician who had not had practical experience in obstetrics. In order to obtain such practical experience our maternities should be open to students under the supervision of a reliable obstetrician. The superiority of modern methods and training was shown in the fact that young doctors, when sent out to a case by their busy superiors, gave their directions, washed their hands, and managed the lying-in chamber in a cleanly and practical manner, which often led to their employment thereafter in preference to the older members of the profession. All the maternities of Philadelphia, with one exception whose charter would not permit, were open for instruction to students. In private practice the indiscriminate and foolish use of the forceps was due to the old, not to the younger school.

As to nurses, a few years ago they were looked upon simply as a pair of hands—and usually they were in deep mourning: they were very filthy.

He was glad to hear Dr. Garrigues praise the Simpson forceps. It was a life-saving instrument. With it one could bring forth alive many infants which formerly under the use of the Hodge and other older forceps were still-born. Even in Philadelphia, justly celebrated as a medical educational centre, he found many physicians ignorant of the very existence of the axis-traction principle.

Dr. W. Reynolds Wilson, of Philadelphia, Pa., referred to the methods of teaching practical midwifery to students in a maternity with which he was connected, each student being required to sign a card that he had not been engaged recently in pathological work, that he would observe certain aseptic rules, etc. By strict enforcement of the rules they succeeded in keeping the puerperal fever percentage very low.

Dr. F. Zórraga, of the City of Mexico, said he had not used the forceps presented by Dr. Hoffman, but it did not seem to him to possess the advantages which had been advanced in its favor. He did not think it rendered compression more effectual, and if it were to slip, as he thought it was liable to do, it would cause much injury to the mother.

Dr. R. L. Sibbett, of Pennsylvania, said that his practice was village and country; that it was only those connected with hospitals who could have all the advantages of our science; but it should be remembered that three-fourths of mankind were born out of cities. His own impression was that in obstetrics to-day instruments were used too frequently; that axis-traction forceps were all right theoretically, but he doubted whether they would come into general use, especially in the country.

Dr. Chestnut, of Philadelphia, Pa, thought the advantage of such meetings as this was a diffusion of knowledge and the introduction of improved methods, such as were found in hospitals

into general practice. Regarding the forceps exhibited by Dr. Hoffman, he thought the tapes constituted its weak points; that they were liable to break, as they had once done in Dr. Hoffman's hands.

Dr. Nelson, of Virginia, said that a good many years ago he applied the Hodge forceps in a given case and was unable to extract the child, then took out his handkerchief and put it into the fenestra, after which he was able to extract the child without difficulty. That was before he had ever heard of axis-traction or of the Tarnier forceps.

Dr. Edward A. Ayers, of New York, said that we had to work, as it were, in the dark in the use of the axis-traction forceps, which was not true of the older class of forceps.

Taking, say, the Elliot or Simpson forceps, he applied them with a knowledge of the position of the occiput, and in making traction deviated slightly from the median line in order to favor rotation. He also took off the screw tap at the handle and regulated the pressure entirely by his hand. One finger of the right hand was kept against the head, which enabled him to judge whether rotation was taking place properly and whether the blades were likely to slip. He did not mean to say, however, that he never used the axis-traction forceps. It was certainly of decided advantage, in that the traction was made in the line of the canal. He did not approve of keeping the instrument on during extraction through the vulva. It necessarily enlarged the diameters of the extruding object and increased the liability to tear.

Dr. Joseph Price, of Philadelphia, Pa., was called upon to close the discussion. He said it was a common thing in the large cities and societies to make some little criticism of the country practitioner. The work which they attributed to him was likely to consist of vaccinating the baby and using a little electricity, which was about as far as he ought to go. This notion, however, was an unjust one, at least so far as the younger members of the profession in the country were concerned; for, starting out with the excellent experience which they were able primarily to avail themselves of during their student days, they often performed superior work. Moreover, it should not be forgotten that the first ovariotomy and the first operation for ectopic pregnancy were performed by country practitioners. Yet among all classes and in all localities there was room for improvement.

Referring again to teaching in maternities, he said he had tried to impress the importance of the ante-partum and post-partum douche. He always used them, but he valued the ante-partum douche more for saving eyes than for saving mothers. He believed that if every mother should receive the ante-partum douche it would result in reducing the number of blind in our asylums from five to one. Ophthalmia in the Eye Dispensary

of Philadelphia was now hardly known, whereas a few years ago it was the prevailing affection. In a maternity there during a recent period there had been but three cases of ophthalmia out of thirteen hundred births, and all the mothers had received the ante-partum douche except these three cases, where circumstances made it impossible. Some years ago ophthalmia neonatorum in country districts was unknown; but now, since the advent of the drummer, the bummer, and perhaps the reckless medical student, it occurred there occasionally.

Dr. Price condemned the reckless and indiscriminate use of the forceps. Symphysiotomy had been revived with some flourish of trumpets, but he was satisfied that he could extract any living child with the axis-traction forceps which could be extracted after symphysiotomy. He was also of the opinion that the axis-traction forceps actually protected rather than endangered the perineum as the head passed through the vulva. It lifted the head against the symphysis and lessened the pressure against the soft parts, while the old forceps would pull the head directly through the perineum.

THE INFLUENCE OF SURGERY UPON MODERN OBSTETRICS.

Dr. Thomas Opie, of Baltimore, in a paper with this title, touched upon the influence of antisepsis, laparatomy for ectopic gestation, for puerperal peritonitis, and other legacies of surgery, upon the practice of obstetrics. The general practitioner who attended midwifery cases must keep pace with modern advancement if he would reduce the number of his cases of laceration, of still-birth, of puerperal fever, etc. The first thought of the surgeon to-day was, Am I clean? Are my instruments and appliances clean? Are my assistants clean? These should also be the questions asked of himself by the obstetrician.

Dr. Opie condemned the murderous violence practised by midwives or mothers upon themselves. He also regretted the disposition shown by many women to avoid the responsibility of nursing and caring for the infant after birth.

SYMPHYSIOTOMY.[1]

Dr. Henry J. Garrigues, of New York, read this paper.

Dr. Noble, of Philadelphia, said he thought the chief advantage of symphysiotomy was that it would do away largely with craniotomy on the living child. Although Cesarean section and Porro's operation had ceased to be very dangerous, it was impossible to convince the public of that fact, and craniotomy had continued to be performed. He had done symphysiotomy once and assisted in another case. In both instances they had followed the Italian method—had cut from behind forward—and he thought with Dr. Garrigues that it were better to adopt it in

[1] See original article, p. 626.

this country in preference to that of cutting from before backward. He was not in favor of version in these cases. He believed the able surgeon should not have a death rate of more than one or two per cent from Cesarean section and none whatever from symphysiotomy. Where death had occurred from the latter procedure it was due to the fact that the woman was already *in extremis* He might add that in his own case he deliberately let the time go by for the induction of premature labor, taking the ground that symphysiotomy was safest for the child.

Dr. Guiterrez said he had not performed symphysiotomy, but he approved the writings and work of Dr. Garrigues in this direction, and thought the new method should supplant craniotomy.

Dr. Garrigues thought Dr. Price was beyond doubt mistaken in the view that any living child could be extracted with forceps if it were possible to deliver after symphysiotomy.

RECENT SURGICAL ADVANCES AND THEIR RELATION TO CONSERVATIVE OBSTETRICS.[1]

Dr. W. Reynolds Wilson, of Philadelphia, read a paper with this title.

PUERPERAL SEPSIS.[2]

Dr. Edward A. Ayers, of New York, read a paper on this subject.

A number of papers in the hands of the secretary were, in the absence of the authors, read by title.

A vote of thanks was tendered the officers, after which the Section adjourned.

TRANSACTIONS OF THE OBSTETRICAL AND GYNECOLOGICAL SOCIETY OF WASHINGTON.

Stated Meeting, March 18th, 1892.

The President, W. W. Johnston, M.D., *in the Chair.*

Dr. John T. Winter reported

TWO CASES OF PHLEGMASIA DOLENS.[3]

Dr. W. P. Carr, in opening the discussion, said we should distinctly define the disease in order to discuss it intelligently. In examining the older literature of the subject he had found that the French authors especially spoke of inflammation of

[1] See original article, p. 648. [2] See original article, p. 657.
[3] See original article, p. 680.

the superficial veins as being the cause; while later writers, except the French, considered the condition to be due to thrombosis. He had read of cases occurring in the arm. The question arises, Should we consider all cases of thrombosis as phlegmasia dolens? He thought it best to follow the rule suggested by Dr. A. F. A. King, from whose book he got the most satisfactory information upon the subject. He found many cases reported as produced by other causes than parturition. There were three sets of causes. Many cases proceeded directly from inflammation of the uterine or peri-uterine tissues, others were due to alterations in the blood, while others were attributable to weakening of the circulation. Of the first, in which the disease proceeded directly from the uterus, nine-tenths followed labor. Septic infection was much more common after labor than was generally supposed. The infection might extend to the common or external iliac vein thus producing the disease. He described the condition found post mortem in a woman who died in the puerperal state. There was infiltration and pus around the uterus and broad ligaments, involving the iliac vein. Had the patient lived longer he had no doubt phlegmasia would have followed. Cancer of the uterus involving the vein would produce phlegmasia. Most cases were reported as thrombosis of the femoral vein. He thought the iliac was the one affected.

Of the second set of causes, the toxic materials of rheumatism and Bright's disease retained in the blood were causes of inflammation of the serous membranes, and, the lining membrane of the blood vessels being of that character, phlebitis might result from their presence.

Third, pressure on the vena cava had a tendency to produce dilatation of the veins below.

There was little difference of opinion as to prognosis and treatment. He thought that prophylaxis was overlooked, and that antisepsis should be strictly enforced with the puerperal woman. In Dr. Winter's first case there was Bright's disease with consequent alteration of the blood. In the second case there was a condition of weakened circulation produced by the exhaustion of hemorrhage.

Dr. A. F. A. King said he agreed in the main with what Dr. Carr had said. In one of the cases reported there was uremic poisoning of the blood; in the other impoverishment of the blood by hemorrhage, producing a condition of inopexia. He objected to Dr. Winter's putting ice in the uterus and keeping it there so long. Hemorrhage increased the coagulability of the blood, as did septicemia. Coagulation of the blood was its last act of vitality, and, thus poisoned, it was liable to die. Sick blood coagulated more readily than healthy blood. The treatment would be the same whether the clot formed first or the inflammation preceded.

Dr. W. P. Carr said that poisoned blood clotted because, in coming in contact with the walls of the veins, fibrin ferment, fibrinogen, etc., were set free.

Dr. A. F. A. King said slowness of circulation was a cause of clotting, as in heart clot. The patient being kept in a horizontal position, it was not so likely to occur.

The President, Dr. W. W. Johnston, said that thrombosis took place after sepsis had passed off, as in convalescence from typhoid fever; so also after the subsidence of puerperal fever. He thought that something more than a poisoned state of the blood was necessary to account for the condition.

Dr. G. N. Acker said he was surprised to hear that both of Dr. Winter's cases were affected on the right side. He had had two cases, in both of which the left side was affected, and the books spoke of the disease as occurring on that side. One of his cases was delivered with forceps; she recovered entirely, except having a slight weakness in the limb. The second case had some premonitory symptoms, as pain on the left side, and the suffering continued after much exercise. He asked Dr. Winter if there were any premonitory symptoms of the disease before labor. As to prognosis, he thought we should be cautious not to promise complete recovery. The treatment was rest and efforts to get the veins in a healthy condition.

Dr. A. F. A. King objected to the friction of the limb in the application of liniments, because it might loosen clots, which might produce pulmonary thrombosis. He disputed the wisdom of raising the limb or the foot of the bed.

Dr. W. W. Johnston asked Dr. Acker if the intima of the veins was the same as in other serous membranes.

Dr. Acker said yes, and in return asked Dr. Johnston to state his views as to the propriety of raising the limb. He used belladonna and other soothing applications, and enveloped the limb in cotton wool.

Dr. Johnston, in reply to Dr. Acker, said that in elevating the limb he considered the comfort of the patient.

Dr. J. T. Winter, in closing, said there were no premonitory symptoms in his first case. As to the second he could not say, as he saw the patient for the first time after the labor had commenced. He had examined the urine of the first patient lately, and it contained albumin. The leg was still swollen.

Stated Meeting, April 15th, 1892.

The President pro tem., A. F. A. King, M.D., *in the Chair.*

Dr. Edmund Lee Tompkins read a paper entitled

EXOPHTHALMIC GOÎTRE IN WOMEN.[1]

[1] See original article, p. 669.

Dr. Wm. M. Sprigg said he had had five cases of exophthalmic goître in his practice. Had one under observation at that time, in which degeneration of the goître had taken place. He treated the case with electricity and the tumor was somewhat reduced. He lost sight of the patient for a time, but recently she had come under his care again with cystic degeneration. Three days previously he had aspirated the tumor, evacuating several cysts, and the tumor collapsed.

Dr. A. F. A. King asked if the use of lime water, as recommended, would not have a tendency to encourage the growth of goître. Said he had had a case some years ago who went to a limestone country and the goître grew rapidly.

Dr. G. N. Acker said he had used aromatic sulphuric acid in several cases with decided benefit. He had two cases at that time, in one of whom the goître was quite marked. When she was pregnant her pulse was increased in frequency and there was greater protrusion of the goîtrous tumor.

Dr. E. L. Tompkins, in closing the discussion, said that Wilmer had said that faradism of the eyes relieved pain. The electrodes applied directly to the enlarged gland reduced its size. Strophanthus and digitalis were beneficial in the disease, as also were strychnia and caffeine.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of April, 1893.

The President, Dr. Herman, *in the Chair.*

The following specimens were shown: Dr. Duncan for Dr. Le Diard, of Carlisle: Fibromyoma of supravaginal cervix removed by laparatomy. Dr. Ballance: Anencephalic fetus.

A paper by Dr. Arthur Giles was read on

OBSERVATIONS ON THE ETIOLOGY OF THE SICKNESS OF PREGNANCY.

With a view to discovering what are the chief factors which influence the occurrence of ordinary morning sickness during pregnancy, the author has analyzed the records of 300 cases at the General Lying-in Hospital, and comes to the following conclusions:

1. About one-third of pregnant women are free from sickness throughout pregnancy; 45 per cent are free from sickness during the first three months. Hence absence of sickness cannot be regarded as of much weight in the early diagnosis of pregnancy.

2. When sickness occurs it begins in 70 per cent of cases in

the first month; a few begin in the second, third, and fourth months; the fifth and sixth are nearly free, and about 9 or 10 per cent begin in the last three months. The duration varies from a few days to all through. Sickness is most frequent during the second month, as found also by Horwitz.

3. Sickness occurs rather more frequently in the last six months among single women.

4. Between the ages of 20 and 25 sickness is least frequent; 90 per cent of primiparæ over 25 suffer from sickness.

5. There is less sickness in the third than in other pregnancies; and the sickness that occurs, both in this and in later pregnancies, is frequently in the later months or throughout. In the first two pregnancies there is much more sickness in the first three months. Comparing primiparæ with multiparæ, sickness in the early or middle portion is more common among the former by 13 per cent; sickness all through is more common in multiparæ by 9 per cent.

6. Sickness in the later period and throughout increases markedly with the weight of the child and placenta; but the mother's sickness does not interfere with the child's nutrition.

7. Women who habitually menstruate painlessly and scantily suffer much less from sickness than those who suffer much pain and lose abundantly. The degree of pain has a more marked influence than the quantity lost.

8. Generally speaking, scanty menstruation is associated with little or no pain, and profuse menstruation with more or less severe pain. Pain before the onset of the menstrual flow is more apt to be sacral, suprapubic pain being more frequent during the flow. Sacral is oftener severe than suprapubic.

In reviewing the subject generally, the author agrees with those writers who do not regard sickness in any form as physiological. The most important views as to the causation of sickness, both mild and severe, are reviewed, and the insufficiency of any one of them to explain all cases is pointed out. Founding largely on the analogy of eclampsia, the author regards vomiting as chiefly one mode of manifestation of nervous instability, and so dependent on the interaction of three main factors:

1. The increased nervous irritability of pregnancy.
2. A local source of irritation.
3. A ready efferent channel for nervous energy (the vagi).

The relative influence of these factors is discussed. The general irritability varies according to age, class, race, and parity, and may manifest itself not only by vomiting, but by chorea, eclampsia, hysteria, or mania.

The mode of action of factors associated with menstruation it is difficult to explain; it may be by its influence on either general or local conditions. The local irritation may act in the earlier or the later months of pregnancy. If the latter, it is often

closely connected with great distention of the uterus, as indicated by twins, or by a heavy child and large placenta.

The fact is recognized that mild and severe vomiting may alike come on from causes quite unconnected with pregnancy.

Dr. Horrocks thought the sickness of pregnancy, in the great majority of cases, began after the first period was missed. He considered the sickness of pregnancy purely physiological, and that the cases in which it was absent should be looked upon as abnormal, just the same as the sickness produced by tartar emetic, in 66.5 per cent of cases in which it was given, was physiological, and its absence in 33.5 was abnormal and required explanation.

As to the cause of the sickness of pregnancy, it was not definitely known. For himself, he looked upon it as a reflex phenomenon, the pregnant uterus being the exciting cause, the nervous system the conductor, and the stomach and vomiting apparatus the parts affected.

Dr. Leith Napier agreed with Dr. Horrocks as to the time when the sickness first appeared. He mentioned excess of the liquor amnii as a cause. He suggested that all cases of simple sickness of pregnancy came under one of two classes: (1) reflex irritability; (2) abnormal uterine conditions, which might be extra- or intra-uterine. He had found much benefit from the administration of menthol in one and a half grain doses.

Dr. Dakin was glad to find the author had not given the supposed "distention" of the uterus by the normally growing ovum to be one of the causes of the vomiting of pregnancy, as the uterus is not distended by, but grows with, the developing ovum. He asked the author if he had made any observations on the occurrence of cardiac palpitations or quasi-asthmatic attacks, either simultaneously or alternating with attacks of vomiting. He pointed out that no deductions could be drawn from the results of treatment of this disorder, seeing that the vomiting ceases of itself at the end of the third month in half the cases. He considered that far more value was to be placed, as regards the onset of vomiting, on the large number of cases observed by the author than on any general impressions.

The President considered the paper a most valuable one, as (*a*) it was based on a larger number of cases than any other he was acquainted with, and (*b*) the author had analyzed these cases in an impartial, unbiassed way. He agreed with what the previous speaker had said as to the fallacy of drawing conclusions about this disease from the effect of treatment. The author had brought out some important, novel, and interesting facts. First, that the patients who suffered pain when they menstruated were more liable to vomit when they became pregnant; and this was not hard to understand, for patients whose nervous systems were very sensitive were those liable to pain and also to vomiting from slight causes. Second, the concur-

rence of vomiting at the end of pregnancy with unusual distention of the uterus. This, he (the President) thought, might be a local effect due to pressure on the stomach. Thirdly, as the late Dr. Matthews Duncan had shown that the most favorable age for child-bearing was 25, and that, as a rule, the third child was the best specimen of a family, so it was precisely in these patients (as shown by the author) that the vomiting was least.

Dr. Giles (in reply) could not agree with Dr. Horrocks that the sickness was physiological, as it was absent in one-third of the cases. The effect of tartar emetic was pharmacological, not physiological, and therefore could not be compared with the sickness of pregnancy. He regarded sickness as due, not to any one action, but to the interaction of several.

Under the term "local source of irritation" he included both pathological conditions of the uterus, such as erosions, flexions, etc., and also the presence of the fetus, which, though not necessarily a focus of irritation, might become so when other conditions predisposed thereto. He quite agreed with the President that the sickness was, above all, a nervous disease.

A paper was next communicated by Dr. Addinsell

ON THE EFFECTS OF THE INFLUENZA POISON UPON THE LYING-IN WOMAN.

He described several cases which had been under his care, and showed how they differed from puerperal septicemia. He also cited the case of a lady who suffered from dengue in her confinement, and its effects on the lochia and milk, pointing out the strong resemblance between this disease and influenza. He considered influenza attacked the weakest spot, and he quoted instances of several patients, seized with the disease at the time of menstruation, who suffered, and still suffer, from ovaritis traceable to that time; and he finally threw out the suggestion that the nervous symptoms so often seen in puerperal septicemia, and which were very marked in the most severe of his series of cases, might be due to the necrotic elements of the endometrium not being carried off in the usual lochial discharge, and thus being absorbed and carried into the cerebral circulation.

The President said that influenza was such a recent disease among us that he did not feel competent to define its "classical" symptoms. He had seen two cases of febrile illness, one consisting of repeated febrile attacks following delivery, the other of a febrile attack interrupting recovery after the opening of a pelvic abscess; and he had concurred with the doctors in attendance in ascribing these cases to influenza, rather because no other cause was found than because there was anything distinctive in the illness.

REVIEWS.

ARBEITEN AUS DER KÖNIGLICHEN FRAUENKLINIK IN DRESDEN. I. Band. REPORT FROM THE DRESDEN ROYAL LYING-IN HOSPITAL. By G. LEOPOLD, Geheimer Medicinalrath, Professor der Gynäkologie, Director der Königlichen Frauenklinik, etc. 11 illustrations. S. Hirzel, Leipzig, 1893.

Leopold's work represents a large mass of extremely valuable material admirably sifted and clearly discussed. It is not simply a report of cases, but an interesting and important chapter of obstetrics, the relative value of obstetrical operations in contracted pelves, is exhaustively treated by Leopold and his assistants. Buschbeck confines himself to "the induction of premature labor" and reports eighty-one cases. Rosenthal discusses one hundred and two cases of version and extraction in pelvic contraction. Zeitelmann's material comprises one hundred and twenty-one craniotomies, and Cörner reports fifty Cesarean sections. Wehle writes an excellent résumé of our present knowledge of symphysiotomy. This last paper, on account of its exceptional value, was extensively discussed in the May number of THE AMERICAN JOURNAL OF OBSTETRICS.

Besides these papers the work contains an interesting description of the management of the Dresden Clinic, and the advantages which this institution offers to physicians who wish to broaden and perfect their knowledge in the field of obstetrics and gynecology. The days spent by the writer in the Dresden Clinic have been of inestimable value to him, and he considers it a debt of gratitude and a duty to the medical profession to again call attention to this peerless institution. The hospital has a larger material than any other German clinic, and, if the ability and high professional standing of its director are considered, it is understood why numbers of young physicians flock there to carry away treasures of wisdom. The cordial reception which one meets there, and the generous liberality with which the rich material is placed at one's disposal, are a pleasant contrast to many similar institutions, in which the director is an unapproachable monarch and the assistants treat the anxious seeker after knowledge as an intruder, only tolerated after paying handsome bribes in the shape of fees for so-called special courses.

The book closes with a chapter by Leopold. He discusses in his clear, masterly style a review of the various operations, their indications, advantages, and shortcomings. Some of his deductions are here reproduced. They all deserve the closest study. A conjugata vera of 7 centimetres in a flat. rachitic pelvis, and 7.5 centimetres in a uniformly contracted pelvis, are lowest limits for which premature labor may be induced with any prospect of favorable result. He says: "The results of premature

labor are as yet decidedly unsatisfactory. We must strive to avoid infection, discover means to induce labor more rapidly, prevent the premature rupture of the membranes, seek the most opportune time at which to induce labor, and surround the premature child with conditions most favorable to its future welfare and development.

"The statistics of version in contracted pelves must also improve. The reports of death from hemorrhage or infection must cease. The most favorable moment for the performance of this operation is a fully dilated os with membrane intact. Undue haste must be avoided. The extraction of the head should never be hurried. By introducing the finger into the child's mouth sufficient air may be inspired to prevent asphyxia.

"If the pelvic contraction extends below the above-mentioned measurements, 7 and 7.5 centimetres respectively, craniotomy, symphysiotomy, and Cesarean section come under consideration. It is doubtful whether the perforation of the living child will ever cease to be a justifiable operation, but it seems as if symphysiotomy is destined to limit the scope of both the relative Cesarean section and craniotomy; yes, it is probable that the relative Cesarean section will be entirely displaced through the symphysiotomy." But Leopold warns not to be too hasty in adopting this operation. The indications and limits have not been sufficiently studied to warrant its universal and indiscriminate performance, and if the warning cry is not heeded we may again be confronted with the terrible statistics of the old Cesarean section.

Every physician will find much of interest in this work, but to the specialist its study is a necessity. J. R.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS. Volume V., for the year 1892. Pp. 522. Philadelphia, Wm. J. Dornan, 1893.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECOLOGICAL ASSOCIATION. Volume V., for the year 1892. Pp. 434. Published by the Association, 1893. W. E. B. Davis, Secretary, Birmingham, Ala.

These volumes, which maintain the high standard set by these societies, contain the papers and discussions which came before their meetings in September and November of last year, many of which have appeared in the pages of this JOURNAL for November and December, 1892.

ABSTRACT.

DÜHRSSEN: THE VALUE OF DEEP INCISIONS OF THE CERVIX AND PERINEUM IN OBSTETRICAL PRACTICE (*Archiv für Gynäkologie*,

Bd. xxiv., Heft. 3).—Based upon a large clinical experience, the indications for these operations are discussed. The dilatation of the cervix by deep incisions is advised in all cases in which the life of mother or child is endangered, while the os is not dilated or its margins are abnormally rigid.

Before attempting this operation the supravaginal cervix must be dilated, and if this condition does not exist it will be necessary to dilate it by means of rubber dilators. The method advised to accomplish this is, to rupture the membranes, introduce a colpeurynter into the cervix, and, after distending the latter to the size of a fetal head, to make slow but continuous traction. The pelvis should be normal, or nearly so. The child must not be of excessive size, and its position either normal or easily corrected. This operation is of especial value in old primiparæ in whom, for one or the other reason, rapid delivery has to be performed. Twenty-four women out of twenty-seven reported cases were above 30 years of age.

The technique of the operation is as follows: Grasp the cervix with two fingers of the left hand, using them as a guide, and, after fixing the anterior and posterior lips with two bullet forceps, divide the os in four places up to the vaginal junction. A pair of long, blunt-pointed scissors is said to be most handy. It is best to divide first the posterior lip, next on either side, and last the anterior lip. After pressing the head into the pelvis the child is extracted with the forceps. In case of an ensuing hemorrhage the uterus and vagina should be tamponed with iodoform gauze. The incisions are not united by sutures. This operation, if properly performed, is practically without danger. Dührssen has never observed an untoward accident. Further tearing of the wounds need not be feared, and a subsequent hemorrhage is rare. The bleeding will generally cease with the extraction of the child and contraction of the uterus.

If the fetal head has passed through the os and the soft parts of the pelvic outlet offer an undue resistance, episiotomy is recommended. Divide on one side only, midway between the tuberosity of the ischium and the anus. The cut must extend down to the levator ani, and is about four to seven centimetres in length. This wound should, after complete delivery, be carefully united. J. R.

ITEM.

The sixth annual meeting of the Southern Surgical and Gynecological Association will be held at New Orleans, La., on November 14th, 15th, and 16th. Members of the medical profession are cordially invited to attend the meeting, which promises to be most interesting.

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ORIGINAL COMMUNICATIONS.

THE PRESENT STATUS OF OUR KNOWLEDGE OF THE PATHOLOGY OF PELVIC INFLAMMATION, WITH SPECIAL REFERENCE TO THE TREATMENT OF PELVIC ABSCESS.[1]

BY

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WE are in a position to-day to entertain clearer views than ever before of the pathology of the pelvic inflammations, and upon these views must be based the treatment of pelvic abscesses. I do not propose to present here a complete history of the subject, but merely to touch upon the salient features of diseases which for so long have been the subject of controversy. My aim is to state concisely what appear to be well-established facts.

PELVIC CELLULITIS.—The history of pelvic cellulitis is one of the most remarkable in the annals of medicine. Dominating

[1] Read before the Section on Gynecology and Abdominal Surgery of the Pan-American Medical Congress.

pelvic pathology from the time of Churchill and Marchal until the recent development of pelvic surgery, it was considered by the foremost men in medicine to be responsible for nearly all of the inflammatory exudations in the pelvis. In proof of this allow me to quote in brief from two of the most influential and respected authors of our age.

Emmet wrote ten years ago: "My convictions are that, while the primary cause of uterine disease lies, through the influence of the sympathetic system, in impaired nutrition, we must look to pathological changes in the connective tissue as the immediate cause of the results we now regard as the original disease in the uterus and ovaries.

"I have never seen a case of ovaritis without inflammation of the neighboring tissues, and, where I have had the opportunity of observing early enough, I have always detected the cellulitis before the ovary became involved.

"We have no means of judging with accuracy as to the condition of the Fallopian tubes during life; but unless they have been directly poisoned by some foreign irritation, as by gonorrheal discharges, the probabilities are that inflammation of their mucous membrane, as of that of the uterine canal, is secondary to some previous lesion in the cellular tissue."[1]

Thomas, about the same time, while accepting the teachings of Bernutz in regard to pelvic peritonitis, wrote thus upon the pathology of pelvic abscess:

"There are three sources of pelvic abscess: (1) the breaking-down of tubercular material deposited in the tissues of the pelvis; (2) suppurative action taking place in the walls of a cavity formed by a hematocele or ovarian cyst; (3) inflammatory suppuration in the areolar tissue, the ovaries, the tubes, the pelvic peritoneum, or the parenchyma of the uterus itself. Of all these sources the third is decidedly the most frequently met with, and is most generally the result of cellulitis occurring after parturition or in the non-puerperal state."[2]

Surgical treatment in every country has been based upon this doctrine. To-day, after the lapse of ten years, these teachings do not appear to represent the truth, and it may be that they do not now express the opinions of the writers. That such views were then held it is perhaps not strange when we remember that

[1] "Principles and Practice of Gynecology," 1884.

[2] "Diseases of Women," 1880.

the enucleation of pelvic pus sacs is of very recent date; that at the time Mr. Tait's work on the ovaries was written (1882) ovarian abscess was regarded as a condition of extreme rarity, and that about the same period the gynecological surgeons of London were under the impression that the pyosalpinx cases all went to the Birmingham market. But these doctrines are still being taught to-day.

Pelvic cellulitis is now recognized as *one of the features* of an acute septic inflammation which invades the sexual organs during the puerperium, and which may occur also as a sequel to surgical operations upon the genital canal. The inflammation of the cellular tissue does not here represent a separate and distinct morbid condition; it is associated with inflammation of the other pelvic structures—the lymphatics, the veins, the mucous and serous coverings of the uterus. The clinical condition thus described is a general pelvic inflammation.

The question has often been raised, and much discussed, whether cellulitis ever exists pure and simple, unassociated with pelvic peritonitis. Practically speaking, we would answer, No! To decide the question absolutely will require more accuracy in autopsical evidence than has been forthcoming during the past thirty years. Cellulitis to the extent of forming distinct pelvic exudations appreciable at the bedside is of infrequent occurrence, even in the puerperal woman. Outside of the puerperal state it may be said that practically we know nothing of it, now that the operation for the deligation of polypus and the use of sponge tents have been abandoned. Improved knowledge of pathology, better acquaintance with the exudations incident to pelvic peritonitis, the frequent resort to abdominal section, have proven the comparative rarity of pelvic cellulitis to the extent of causing noticeable exudations. This statement is true even when applied to cases of most pronounced septic character. In many grave cases of puerperal fever I have been unable to discover lesions due to cellulitis. I have done five life-saving operations on puerperal women in whom the lesions were tubal and peritoneal, and not cellulitic, so far as could be discovered before operation or after opening the abdomen. Others have had a similar experience.

Coe's observations upon the surgical cases which terminated fatally by septic infection are generally known: "Of half a dozen fatal cases of hystero-trachelorrhaphy and incision of the

cervix in which I have enjoyed the rare opportunity of studying the sequences, in every instance the cause of death was acute diffuse peritonitis. In none of these cases was there any evidence of acute cellulitis, although old cicatrices were not wanting."[1]

In the case of a woman from whom a fibrous polypus had been removed by deligation, McClintock found at the autopsy "intense recent peritonitis." This woman lived fifteen days after the operation of deligation, and there was found, in addition to the fatal peritonitis, an abscess of one broad ligament. The great majority of exudations in the cellular tissue undergo resolution. This is true also of very large exudations. Abscess formation is the exception, even in large inflammatory masses. For this statement we have the high authority of Winckel and of Veit in pre-antiseptic times; and in more modern, of Lusk and E. Ziegler.

When suppuration does ensue, the pus collections which may require surgical interference will be found:

1. Between the layers of the broad ligament.
2. In the iliac fossa.
3. In the anterior abdominal wall between the navel and pubes.
4. Possibly in the tissue behind the cervix.

Phlegmon of the broad ligament, the most important of these collections, is usually associated with a recent labor, but it has repeatedly followed operations upon the uterus. It is remarkable how much obscurity and doubt surround, even now, the subject of broad-ligament abscess. There has been the greatest lack of scientific accuracy in the post-mortem reports. Courty[2] says "abscess of the broad ligament is common." W. H. Byford[3] thought that "the most frequent locality of pelvic abscess is between the layers of the broad ligament." Matthews Duncan[4] says "post-mortem examinations have rarely shown the broad ligaments distended with pus." Thomas Savage,[5] recording the forms and localities of twenty cases of pelvic abscess, mentions but two of the broad ligament. One of these followed deligation of a polypus; the other was associated with

[1] New York Medical Journal, May 15th, 1886.
[2] Mann's "American System of Gynecology," vol. i., p. 723.
[3] Ibid.
[4] "Parametritis and Perimetritis."
[5] "Anatomy of Female Pelvic Organs."

a uterine fibroid, and, I venture to suggest, was a tubal rather than a broad-ligament abscess. Berry Hart[1] uses this remarkable language: "There is little doubt that we can have a cellulitis of the broad ligament, and that it may go on to abscess of the broad ligament. This I have seen in an abdominal section by Prof. Simpson, where the existence of pus distending the broad ligament was verified by the aspirator passed in from above." No doubt many observers have mistaken ovarian and tubal abscesses for suppurating phlegmons of the broad ligament. The differentiation cannot usually be made by passing the aspirator. The tube must be separated from the mass. Careful dissection will be required.

During the past year Polk has reported the single case of broad-ligament abscess from cellulitis which he has seen in his entire experience as an abdominal surgeon:[2]

"The woman was in the secondary stage of syphilis, had been confined five weeks prior to the operation, and had been suffering from puerperal fever of moderate severity.

"There were discovered before operation masses on each side of the uterus, that on the right being the larger. On opening the abdomen the ovaries and fimbriated ends of both tubes were found free from any displacement; both fimbriæ were open. A mass of exudation lay between the layers of the right broad ligament, bounded above by Fallopian tube and round ligament, within by the right wall of the uterus, below and to the outside by a line corresponding to the base of the broad ligament. From before backward this mass was one inch in thickness.

"On the left side a similar but smaller mass was found. The masses were dissected from their position and removed. Each ovary and tube was also removed. Examination of the tubes showed a slight catarrhal salpingitis with thickening of tube walls. Cutting into the mass, an abscess was found having no connection with tube or ovary. There was slight thickening of the ovaries from serous infiltration."

The report is to be commended for its scientific accuracy. Joseph Price states that in over fourteen hundred abdominal sections he has not observed an exudation from cellulitis once.[3]

In view of these facts I would emphasize the statement that

[1] "Manual of Gynecology."

[2] New York Journal of Gynecology and Obstetrics, April, 1893.

[3] Personal statement.

suppuration of the cellular tissue of the pelvis is rare as compared with the other forms of pelvic abscess.

CHRONIC CELLULITIS.—Cellulitis has been defined as an *acute* inflammation. Chronic cellulitis, as a discoverable clinical condition, does not rest upon a foundation of exact knowledge. The "parametritis posterior" of Schultze cannot be accepted as a correct definition of the morbid condition to which it is applied. Schröder's opinion was that the shortening of the utero-sacral ligaments was due to a peritonitis. Hart says it should more properly be regarded as a combined peritonitis and cellulitis. Pozzi considers the lesion to be a perisalpingitis about the diseased adnexa. Bandl's[1] extensive and careful dissections show that "in the anteflexion cases residues of inflammation were found in the parametric tissue, in the muscular tissue of the folds of Douglas, and in the connective tissue and peritoneum surrounding them." According to Coe,[2] "the thickening of the utero-sacral ligaments, so frequently alluded to in works on gynecology, has, when carefully dissected out, proved in my experience to be due not so much to a disease of the connective tissue of these ligaments as to a cicatricial condition of the peritoneum covering them."

The propriety of designating these complicated inflammatory processes, in which peritonitis plays the major part, by the term "chronic cellulitis" cannot be justified.

What we recognize as "parametritis posterior" is a cicatricial contraction of all the tissues of the utero-sacral ligaments. This is not a chronic inflammation, but simply the relic of an inflammation long since gone—an inflammation more or less acute in the puerperal woman, and therefore septic in character; or else the result of infection, in the non-puerperal subject, of the cervical secretions by gonococci or other bacterial organisms. So also must we regard the "chronic cellulitis" in proximity to cervical lacerations. It originally is a mild, acute puerperal infection which runs its course. The tissue changes due to this process—"residues" of inflammation—are more or less permanent, even after the cervix has been restored to a healthy condition by trachelorrhaphy. These cicatricial formations, as well as the parametritis chronica, circumscripta, et diffusa of Freund, are of interest to the pathological anatomist, but we are

[1] "Cyclopedia of Obstetrics and Gynecology," vol. xii.

[2] Mann's "American System of Gynecology," vol. i., p. 700.

unable to recognize clinically the existence of the inflammation of which they are the evidence. We therefore deny the propriety of erecting them into a group to be designated as forms of chronic cellulitis. Bandl[1] urged years ago that they should be regarded simply as "remnants" of an inflammation long since gone.

These remnants are often found in the cadaver. Bandl's extensive autopsical observations were made upon three classes of subjects: 1. Girls under 12 years of age and menstruating virgins. 2. Nulliparous women and prostitutes. 3. Parous women.

In the first class "remnants" were rare and were *exclusively* tubal and peritoneal, none parametric.

In the second class "both parametric and peritoneal 'residues' were often found, having their seat around the tubes and ovaries, the latter being connected with each other and with the surroundings of the broad ligaments and the peritoneum of Douglas' cul-de-sac by pseudo-membranes.

"The residues of parametritis are slighter and more obscure than those of peritonitis, but by comparison with normal organs they can easily be recognized."

From these researches it is clear that the cellulitis could not have been recognized clinically, being associated with an overshadowing peritonitis whose lesions markedly predominated.

Polk's investigations[2] corroborate those of Bandl. He states that "in a large number of post-mortem examinations made in the dead-house of Bellevue Hospital it is noticed that, excepting those patients who have died of septicemia, it is the rarest thing to find cellulitis, unless the cellulitis be clearly secondary to a previous inflammation of the pelvic peritoneum."

In Bandl's third class "residues" were even more marked.

We cannot now, without autopsical evidence, accept the oft-repeated statement that pelvic cellulitis occurs in young girls and old women. I have been able to find no positive proof of its existence in the former, and the only authority for its existence in old women is the case cited by Avan. She was 80 years old and had a swelling on the side of the uterus, which Robin found to contain fibro-plastic cells. One swallow does not make a summer!

[1] Loc. cit.

[2] Mann's "American System of Gynecology," vol. i., p. 700.

Conclusions.—1. Pelvic cellulitis is an acute form of disease, recognized clinically only in the puerperal woman, or in one who has suffered septic infection after a surgical operation on the genital canal.

2. Chronic cellulitis is a misnomer.

3. The occurrence of cellulitis to the extent of forming appreciable exudations in the pelvis is of infrequent occurrence.

4. Cellulitis to an inappreciable degree, clinically, often occurs in connection with peritonitis. It is discoverable, on the cadaver, in the shape of small cicatrices, especially in the neighborhood of the tubes and ovaries, between the layers of the broad ligaments, and in the utero-sacral ligaments, and is associated with evidences of extensive peritoneal lesions.

5. When large exudations form in the cellular tissue the great majority undergo resolution. Suppuration is the exception.

6. Pus collections in the pelvic cellular tissue are seldom seen in comparison with other forms of pelvic abscess.

Pelvic Peritonitis.—The gravest lesions, the most numerous, the most difficult to deal with in the practice of gynecology, are those which are caused by inflammation having its origin in one form of infection or another, and which, after obtaining access through the external organs of generation, localizes itself in the endometrium or in the lining of the tubes for a time, and extends therefrom to the pelvic peritoneum and the ovaries—pelvic peritonitis.

This infection may be of a mild character—catarrhal, as it is called; or it may be very pernicious in its nature—that is, gonorrheal; or septic and rapidly fatal. The history of pelvic peritonitis was accurately written thirty years ago by Bernutz. We, his successors, have found little more to do than confirm the results of his labors. It is not until the last few years that they have been fully understood. Pelvic peritonitis is the key to gynecological pathology. The one constant lesion in pelvic peritonitis is diseased tubes—salpingitis.

Pelvic Abscess.—In this paper the term "pelvic abscess" is applied to any collection of pus in the pelvis, no matter what its anatomical relations. No just grounds can be assigned for its limitation to suppuration of the cellular tissue. Medical custom and necessity authorize the use of the word "abscess" to mean a collection of pus in the substance of the tissues or in natural

cavities.[1] Pozzi would apply the term to all encysted pus collections whose enucleation would be impossible or dangerous. At the bedside, where is the man so wise, with tact so erudite, that he can say precisely what are the confines of the pus cavity? The pelvic abscesses which concern us are those which are located in the cellular tissue, on the one hand, and are *extraperitoneal;* and those which, on the other, result from the inflammatory processes that constitute pelvic peritonitis and hence are *intraperitoneal.*

Extraperitoneal abscesses have already been described.

Intraperitoneal abscesses are found in the following localities:

1. Ovarian collections, often large, with several compartments having no channel of communication with each other and none with the uterus.

2. The pyosalpinx cases forming distinct tumors, often simple cystic formations; at other times multilocular in character, and, like the ovarian abscesses, fixed by strong and deep adhesions.

3. Pyosalpinx collections which, by leakage at the fimbriated end, have caused a suppurative peritonitis; the pus cavity being walled in by intestines and oftentimes communicating with the intestinal canal.

4. Fluctuating tumors between the rectum and vagina, encapsulated by the bridging of false membranes or of intestinal coils between the fundus of the uterus and the rectum. These are complex affairs, always associated with pus tubes, and often communicate by an opening with higher accumulations between the intestines.

5. Dermoid suppurating cysts.

In the very great majority of cases the pelvic abscesses which we are called upon to deal with will be found to belong to one or the other of these different varieties of *intraperitoneal* collections. Occasionally we will meet with an extraperitoneal abscess, or we may find both varieties present in the same individual—*mixed* cases.

Diagnosis.—It should be our utmost endeavor in every case to diagnose as accurately as possible the nature of the abscess. The history of the case may be of much assistance. If the patient has not been recently delivered or undergone a surgical operation, we can feel sure that the collection is intraperitoneal.

[1] See Abscess in Foster's "Encyclopedic Medical Dictionary."

The only exception to this rule that I know of is a possible suppurating hematoma. This nearly always implies the existence of an ectopic gestation sac. Even though the case be a puerperal one, the probabilities are that the abscess is intraperitoneal. Careful physical exploration, with a knowledge of the haunts of cellulitic exudations, will generally guide us to the truth. When cellulitic abscesses exist in association with large intraperitoneal exudations a diagnosis may be impossible without resort to abdominal section.

Treatment.—Just so long as the doctrines of cellulitis which I have quoted in the beginning of this paper dominated pelvic pathology, no method was proposed for opening pelvic abscesses except through the vagina, or by incision of the outer structures of the abdominal wall above Poupart's ligament. When Tait devised the method of abdominal section for pelvic abscesses it was not suggested by a more enlightened pathology, but was undertaken because his experience with the vaginal route had been that the relief thus obtained was, in most of the cases, neither complete nor permanent. The experience of other surgeons with vaginal methods has been, like that of Tait, unsatisfactory.

Let us consider methods of treatment applicable—

1. *To extraperitoneal abscesses.*

Operation through the vagina is the operation of election if the abscess lies between the layers of the broad ligaments, or in the cellular tissue between the cervix and rectum, and if it is found that an opening can there be judiciously made.

Some broad-ligament collections located high, and extending toward the side of the pelvis, can be better opened by an oblique incision through the structures of the abdominal wall above the groin down to the peritoneum. This membrane being then pushed aside, the finger can be worked downward into the abscess. Other broad-ligament collections extending downward near the rectum can be safely reached by an opening made through the ischio-rectal fossa—"vertical perineotomy," as practised by Hegar and others.

Iliac abscesses are to be reached by careful section of the abdominal-wall structures near the iliac crest.

In a case of desperate character, no matter what the anatomical relations, I would avail myself of an opportunity to open the abscess wherever it might point, through the cutaneous surface

or through the vagina, but hardly through the rectum, in the hope of gaining time to improve the situation.

Yet my experience with the vaginal method of operating, even under such circumstances, has been very unsatisfactory, and I would not deliberately select it except for extraperitoneal abscesses. By this method I have cured a few cases and benefited others, but in the main it has been disappointing, and I feel sure it must prove so in the treatment of all intraperitoneal collections. In one of my experiences the patient had contracted a pelvic peritonitis after standing on damp ground at a funeral. The gastric symptoms were distressing; she lost strength and flesh fast; and after four weeks a tumor was found rising above the pubes on the left side. She was a bad case for operation, and I used a trocar, at a venture, through the roof of the vagina, though there was no pointing, or spot that seemed favorable for puncture. Thirteen ounces of pus were withdrawn, but no improvement followed. She steadily declined like one dying with phthisis. In another, the patient was first seen six weeks after a miscarriage, with a fluctuating tumor between the uterus and rectum. It was incised with a knife and its cavity washed out daily with a carbolic solution. In a few weeks it closed, the woman apparently was restored to health, and it looked as though the method of treatment was correct. Yet a few years afterward she was brought to me in a state of collapse from rupture of a tubal pregnancy. I operated under most unfavorable circumstances, and she narrowly escaped death.

In a third case the pelvis was filled with a hard mass which seemed to be a solid tumor, but the history showed that it was an exudation following labor. The patient's husband would not consent to abdominal section. An incision was therefore made behind the uterus. The finger passed into the abscess cavity was used as a curette. A rubber drainage tube was stitched to the edges of the opening, and for one month the most assiduous attention was given to the closure of the abscess, but without avail. I then lost sight of her.

I would not elect the vaginal route for the treatment of any but extraperitoneal collections. Notwithstanding the ingenuity displayed in devising, and the skill in performing, vaginal operations, the results generally have been unsatisfactory. Pus has been imperfectly evacuated, fistulous drains continue to discharge, and diseased structures remain in the pelvis, precluding

the possibility of a cure. This statement is made with the knowledge that now and then the trocar or the bistoury has successfully dealt, for the time being, with a unilocular tubal or ovarian abscess after inflammatory processes were quiescent; yet the subsequent history of these cases is not written.

2. *To intraperitoneal abscesses.*

The ideal method for the treatment of intraperitoneal pus collections is abdominal section followed by the enucleation and removal of diseased structures. There is a period in the history of all intraperitoneal abscesses when this procedure is feasible and safe. Unfortunately many cases come to us after long delay, with grave complications, and the method must be modified. Increasing experience leads us to appreciate more and more the value as well as the gravity of this procedure. In very large abscesses shock is often great, sometimes fatal. Enucleation may not be possible without doing irreparable injury to bowel, bladder, or other structures. Yet, in the majority of cases, in intelligent hands the method is practicable and safe, and it leaves the pelvis free from disease. Where enucleation is found impracticable after the section is made, abdominal drainage leads to satisfactory results, and to it may be added intelligent vaginal drainage, should it seem to be required. In four instances when, after opening the abdomen, I found enucleation impossible and the pus sac too deep to allow the stitching of its edges to the incision, parallel drainage was used after opening and cleansing the abscess cavity. A glass drain was passed to the bottom of the sac, and a rubber or gauze drain alongside to relieve the peritoneum. These patients made good recoveries and have remained well for years.

Large ovarian abscesses with multiple compartments are difficult to deal with. Such an abscess may fill the entire pelvis, extending from one iliac crest to the other, and reaching above the navel. Appearing like a uterine fibroid, it may seem to be a solid tumor, may obliterate the vaginal cervix, and so soften and shrink the uterine body that the operator will require the aid of an assistant's finger in the vagina, after enucleation has been effected, to guide him to the limits of the uterus. The enucleation of such a tumor will involve great shock, and the operator's judgment may be taxed to enable him to decide whether to enucleate or to incise, break up the partitions which

separate the several cavities, and drain the whole. The saving of life is the first consideration in these cases.

I report here a case of *acute* ovarian abscess which was treated one year ago. It was that of a young woman with a pinhole os, suffering pain in the right ovary, and sterile after two years of married life. There were no signs of endometritis or salpingitis, but there was more or less constant pain in the right ovary. Treatment was of little benefit, but after a time, and the use of baths at the Hot Springs of Arkansas, she was relieved of the pain. She then returned to me, having been married three years, for the relief of sterility. There was no exudation in the pelvis, no tenderness on pressure. Under the strictest antisepsis the cervix was divided, the uterus scraped with a dull curette, its cavity irrigated and then packed with a gauze drain. The vagina was filled with an antiseptic tampon. The dressings were removed in due time, and all went well for a week, when she had a bloody discharge, and pain in the right ovary, without fever. Nausea and complete anorexia were persistent. The pain continued, a globular swelling appeared in the right ovarian region, and after three weeks from the time of the operation the patient was *in extremis*, with a globular tumor occupying the lower half of the belly and extending from one iliac spine to the other. The abdomen was incised and the tumor exposed. Pus was seen oozing through its wall near the lower end of the incision. The sac was opened, stitched to the edges of the wound, and drained. Rapid recovery ensued, leaving the pelvis clear of all appreciable exudation. Enucleation would have been easy, but would, I feel sure, have resulted in the patient's death. A more radical operation could be done later with good prospect of success, if need be.

The pyosalpinx cases must be enucleated. Very large tubal collections occasionally fill up the pelvis like the ovarian abscesses, and, if their complete removal involved too great shock, could be treated by incision and drainage. Cases of pyosalpinx which by leakage cause a suppurative peritonitis, and perhaps establish communication with the intestine, cannot usually be safely treated by enucleation.

Three years ago a puerperal woman was seen in the fourth week after delivery, profoundly septic, with high fever, sweats, and rapid pulse. There was a tumor on the right side of the abdomen. After section and carefully separating coils of intes-

tine, a pus cavity was opened which communicated with the bowel and with the tube on that side. Cleansing and draining were all that could be done. Complete recovery followed, and she is well to-day.

Still more recently another case, in which from one ilium to the other the abdomen was as hard as a board, and an inch below and to the right of the navel there was a fistulous opening through the abdominal wall. She was profoundly anemic and dropsical, and had been bed-ridden the greater part of one year. After confinement, twelve months before, she had puerperal fever. She got out of bed with masses on each side of the uterus. Five months after delivery she was suddenly seized with severe abdominal pain and collapse. An abscess formed and discharged through the opening in the abdominal wall. Wasted as she was by suppurative fever for nine months, she evidently had but little longer to live. Section through indurated structures revealed a confused mass of exudation without landmarks. Cautious breaking-up of this opened the abscess cavity, and at the same instant there was an escape of water. Two separate cavities had been thus laid open. They were both drained, as was also the healthy peritoneum above. While yet half-unconscious from ether, her first cry was that she wanted to urinate. The bladder had been opened, and all the urine for a time came through the drain. She recovered absolutely and completely, without unfavorable symptoms, and is in good health to-day. These cases had not the vitality to stand an enucleation.

Intraperitoneal abscesses discharging through the rectum constitute a difficult class to deal with. In some the sac can be opened, stitched to the edges of the abdominal wound, and drained. The discharge of pus through the rectum will then cease. In others enucleation must be done, and the rectal opening closed, if possible, by suture. Some cases may require to be let alone. The fluctuating tumors between the rectum and uterus can, as a rule, be properly dealt with only by section.

Suppurating dermoid cysts constitute a quite common variety of pelvic abscess. They are usually found under complex pathological conditions. The pelvis is choked with inflammatory masses. Section reveals, perhaps, a small parovarian cyst extending deeply between the uterus and rectum, a large Fallopian tube with greatly thickened walls, and a suppurating dermoid cyst, all blended closely together. Nothing but an enucleation,

often attended with great difficulty, can possibly remedy such a condition. No vaginal operation can effect a cure.

In conclusion, I would insist that all intraperitoneal abscesses should be approached through the peritoneal cavity by abdominal section, with a view to enucleation and complete removal of the diseased structures which constitute the pus sac, and which, if allowed to remain, are liable to cause a recurrence of pelvic disease. I would deprecate all endeavors to reach these abscesses by extraperitoneal methods; believing, should the complete and radical removal of the diseased tissues be impracticable or attended with too great risk, that drainage through an abdominal incision is safer and is attended with more complete relief than can be obtained by any vaginal operation. Any other conclusion than this is unworthy the consideration of those of us who are now aiming and striving to do thorough work in dealing with the varied problems of abdominal and pelvic disease.

Vaginal hysterectomy, proposed by Péan and advocated by Ségond as a substitute for abdominal section in the treatment of pelvic suppuration, commands consideration only from the high character of its authors. This method is applied by them to the relief of all bilateral inflammatory lesions of ovaries and tubes, whether simple or complex, suppurative or non-suppurative. After removal of the uterus the trocar is used. This method is based on the idea that the primary lesion is found in the uterus, and that its existence there perpetuates the disease in the appendages. Its authors claim that removal of the uterus leads to atrophy of the inflamed appendages. The operation is commended on the ground that it is devoid of shock, that it is easy of accomplishment, and that it leaves no visible cicatrix. Vaginal hysterectomy, as here made use of, is in principle but a modification of the old methods of vaginal incision and puncture, and, when applied to intraperitoneal abscesses, is open to the objection that it must leave in the pelvis diseased structures. The theory that removal of the uterus will eradicate the cause of the disease is a fallacy. Bernutz's dissections showed that though the pelvis was full of exudation masses, in some cases the endometrium was healthy, in others it was inflamed, in only one was it covered with pus.

We are often cognizant of the fact that appreciable disease has disappeared from the endometrium before we are called upon to operate for disease in the pelvis. In some cases we

decide to curette the endometrium before or after enucleation and removal of diseased appendages.

The operation, removal of the uterus *morcellement*, must necessarily be a groping in the dark. What is beyond? Can the finger define pus collections? Can we wisely and successfully evacuate the different compartments of an ovarian or tubal abscess by plunging a trocar into the exudations, as Ségond[1] is said to do after the hysterectomy? Is it good surgery, or is it humane, to extirpate the uterus in a woman who, in many of these cases, is suffering from an inflammation which is curable without any operative procedure?

Their claim that hysterectomy leads to atrophy of the inflamed appendages is contrary to reason and to observed facts.

"Grammatikati has reviewed the after-histories in a number of cases in which the ovaries have been removed, the uterus being left behind, and compared them with the histories of cases where the uterus has been removed by vaginal hysterectomy (Péan and Ségond's operation), the ovaries being left behind. Removal of the ovaries, if complete, is followed in at least half the cases by menstrual molimina which last for a few months. Then appear climacteric troubles. When the uterus is removed and the ovaries left behind the effects are far more serious, especially in young subjects. The menstrual molimen, which cannot find its natural relief, becomes very trying; hence the ovaries should be removed with the uterus. Contrary to what is taught by the supporters of hysterectomy, it appears that the ovaries do not disappear if left behind. Gammatikati examined the ovaries of a woman, 43 years old, three years after he had removed her uterus. He found the ovaries quite normal and full of follicles, some ripening or breaking."[2]

The Péan-Ségond operation is incapable of producing a permanent cure in most of the grave forms of pelvic suppuration. It is incapable of dealing with those cases in which it is not only necessary to remove diseased organs, but to liberate the extensive bowel adhesions associated with them. It is powerless to contend with the cases of pelvic inflammation due to ruptured Fallopian pregnancy. While this method might successfully drain a suppurating dermoid, the tufts of hair growing from its walls, the plates of bone, and the teeth embedded in its

[1] British Obstetrical Society Transactions, 1892, p. 449.

[2] British Medical Journal, October 1st, 1892. Epitome, p. 55.

tissues could not be expected to disappear by any process of atrophy or absorption.

Lastly, the statistics of the two operations, as furnished by Pozzi, are largely in favor of abdominal section.

THE RELATION OF CERTAIN URINARY CONDITIONS TO GYNECOLOGICAL SURGERY.[1]

BY

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EARLY in my career as an operator I lost three patients from suppression of urine following operation. This experience called my attention forcibly to the relation which exists between the condition of the urinary organs and the successful or disastrous results of operation, and led me to give the subject careful and systematic study. It is my purpose to record in this paper the observations which have been made and the conclusions which have been reached in a study of some five hundred cases at the Kensington Hospital for Women. It will be convenient to cover the subject by a discussion of several propositions, the discussion being rather from the standpoint of the practitioner than from that of the pathologist.

1. *Albuminuria is a Frequent Condition among Gynecological Patients.*—It is my custom to have the urine of every patient admitted to the hospital examined chemically and microscopically. When convenient the urine of patients requiring grave operations is examined repeatedly, and this is always done when the first examination proves unsatisfactory. The "heat and acetic acid" and the "ring" (nitric acid) tests have been used to determine the presence of albumin, being considered the best for clinical purposes. It has been found that ten per cent of the patients admitted have albuminuria.

2. *Albuminuria often is not significant of Serious Disease.*—In general medicine it has been learned that albuminuria is by no means necessarily of serious import. Frequently it is of a transient character, due to acute conditions from which the

[1] Read before the Section on Gynecology and Abdominal Surgery of the Pan-American Medical Congress.

patient entirely recovers. This is even more frequently the case among gynecological patients.

The urine, of women, intended for a chemical examination should always be drawn by catheter. Unless this is done the presence of albumin in the urine may mean only that a certain amount of vaginal discharge, or perhaps of menstrual discharge, has become mixed with the urine. In private practice, when a catheter is not available, the woman should at least be given a vaginal douche and have the external genitals washed before passing urine intended for examination. In this way fairly accurate results may be obtained. Eliminating such external sources of contamination, albuminuria in women may be, and often is, due simply to bladder irritation or to cystitis. Should a careful examination of the urine show the absence of tube casts and the presence of some albumin, pus, and bladder epithelium, especially if the specific gravity is 1.018 or more, it would indicate that the albuminuria was from bladder and not from renal disease.

Albuminuria from ureteral disease and from pyelitis is not so very easy to determine, and it is to be hoped that the use of the ureteral catheter in the study of this question may help to make it clear.

Albuminuria from the above sources does not unfavorably influence the prognosis of operations.

Albuminuria of renal origin is not always significant of serious disease. At times it is not accompanied by the presence of tube casts in the urine and is of an intermittent character; in such cases being due probably not so much to the renal disease as to some interference in the metabolism of the nitrogenous food products. Several such cases have been under my care; and quite recently I performed ovariotomy upon one in which large quantities of albumin would be present on one day, and the next day it would be entirely absent. The urine was otherwise normal. The urinary condition was not at all influenced by the operation. Repeated examinations of the urine in this case showed the absence of tube casts, and I believe that the kidneys are perfectly sound.

Another class of cases in which albuminuria of renal origin is not significant of danger is that in which it is produced by the presence of large tumors. Here the presence of the albumin is due to the pressure of the tumor upon the renal vessels.

3. *The Presence of Tube Casts in the Urine is not always significant.*—In the case of large tumors, even the presence of tube casts in the urine does not signify that the patient will not recover from operation. In many such cases the condition of the kidneys is directly due to the pressure of the tumor, and when this is removed such patients often get surprisingly well and their kidneys become practically normal.

But all gynecological cases requiring operation and having tube casts in the urine require, in my judgment, the most careful consideration. Repeated examinations of the urine to determine not only the presence and quantity of albumin, casts, and sugar, but also its specific gravity, the total amount of the urine passed, and the amount of urea and other solids it contains, are of the greatest importance. Should such examinations show the existence of gross structural disease of the kidneys and indicate the early death of the patient from the kidney disease, it is more than questionable in such cases whether it is wise to operate.

The existence of chronic interstitial nephritis (contracted kidneys) is a contra-indication to any operation of gravity. In such cases at times albumin is absent or only occasionally present, and then in very small quantities. Tube casts may be absent, or at least the most careful examinations may fail to reveal them. If repeated examinations of the urine show the occasional presence of small quantities of albumin and of granular casts, and a low specific gravity, the surgeon should be on his guard. A woman having such kidneys will not survive a serious and prolonged operation. She will die from shock or from suppression of the urine.

I believe that the prognosis after operation is most favorable in women (the subjects of renal disease) having fairly large tumors, especially ovarian cysts. In this class of cases, in general, the operation is quick and easy, and no septic material is present. By the operation the pressure of the tumor is removed from the crippled kidneys, with the result that they secrete usually more urine than normal kidneys. An illustrative case will be given. When kidney disease complicates a small tumor (or, in other words, when the kidney disease is not dependent on the presence of the tumor), the prognosis depends entirely upon the character and extent of the kidney disease. The factor of the removal of the intra-abdominal pressure does not come into play in such cases.

In cases of tubo-ovarian inflammation, especially of marked character in women whose health is entirely broken down, the prognosis is very bad when the renal disease is of a serious character. The reason why such cases do not do so well after operation as cases of large cysts is clear. The factor of the removal of the intra-abdominal pressure is absent here, and in addition we have a long operation, involving considerable handling of the pelvic viscera and usually the escape of septic matter into the peritoneal cavity, necessitating irrigation and drainage. The long operation and the handling of the abdominal viscera promote shock, and such patients are apt to die from suppression of urine. I speak from the experience of two deaths in this class of cases.

Occasionally women will have suppression of urine after operation even when no kidney disease exists. I have had one such case, in which the operation was very simple.

4. *The Secretion of Urine is diminished, after Operation, for several Days.*—This statement is a matter of universal observation. I have had careful records kept of the amount of urine passed by patients after abdominal section in all my cases. These records are practically accurate. In the time at my disposal it was not possible to look through the entire list of cases, hence I have selected the last fifty consecutive celiotomies for tabulation. Dr. W. E. Parke, assistant in gynecology at the Kensington Hospital for Women, has kindly prepared this table for me. We find that the patients pass on an average ten ounces of urine the first day after abdominal section, fifteen ounces the second day, thirteen ounces the third day, fifteen ounces the fourth day, and nineteen the fifth day, after which time the amount gradually increases. There are certain sources of error in this table. The first day really includes only about eighteen hours, and is made up of that part of the day subsequent to the hour of operation, and the following night. The other days are twenty-four hours each. On the third day, at times, the amount of urine is estimated, because upon that day the patient's bowels move. With the free purgation naturally the amount of urine secreted is less. The same source of error exists for the subsequent days. One patient died at the end of twenty-four hours—a slight source of error for the following days. The smallest amount of urine passed on the first day was three ounces, the largest amount thirty-three ounces. The

smallest amount passed on the second day was six ounces, the largest amount twenty-nine and a half ounces.

As illustrating what I have said with reference to the relation of the condition of the urine to operation, I will make brief reference to the following cases:

Case 1 illustrates the fact that suppression of urine may follow celiotomy, even after simple operations, in women having sound kidneys. This patient had healthy kidneys, and the operation consisted in removing the ovaries, the seat of chronic inflammation; yet on the third day she developed an acute nephritis, was extremely ill with uremic symptoms, but fortunately recovered. The history of Case 1 is appended.

Case 2 illustrates the danger of death from suppression of urine, after even a simple celiotomy, in women suffering with well-marked chronic kidney disease. This woman had small, contracted kidneys and was a physical wreck at the time of operation. The operation consisted in the quick removal of a small ovarian tumor and of a small parovarian tumor, the operation consuming only fifteen minutes. In this case the kidney disease had antedated the presence of the tumor, and the vitality of the woman was so reduced that the shock from even so simple an operation caused death from suppression of urine.

Case 3 illustrates the favorable issue of operations for large ovarian cysts when albumin and casts are found in the urine as a result of the pressure of the tumor. This patient was a feeble and greatly emaciated woman, who consulted me when the ovarian tumor was very large, quite nodulated, and very painful. The presence of albumin and granular casts in the urine, the nodular outline of the tumor, and the fact that it caused great pain (giving rise to a suspicion of malignancy) caused me to give a guarded prognosis as to the issue of the operation. The patient's conclusion was that, as I could not promise her positively that she would recover from the operation, she would live as long as possible with the tumor and then have it out. She carried out this purpose literally, and it was not until her kidneys were greatly crippled, and that she was suffering with paresis of the bowels and with orthopnea from the pressure of the growth, that she desired operation. The removal of the tumor was easily accomplished, and she made as good a recovery as any patient upon whom I have ever operated. Curiously, she passed very much more urine after her operation than is the

rule, the first day passing twenty-nine and a half ounces; the second day thirteen ounces which was measured, and very much more with bowel movements; the third day twenty-five and a half ounces, etc. The condition of the urine constantly improved, and at the present time, six months after operation, it is perfectly normal.

Cases 4 and 5 illustrate the grave prognosis as to operations done for well-marked inflammatory conditions of the uterine appendages in women having serious chronic renal disease. Case 4 had small, contracted kidneys and was the subject of both gonorrhea and syphilis (tertiary). Her general health was fairly good. The operation consisted in the quick enucleation of diseased uterine appendages from a pelvis absolutely filled up with exudate. The duration of the operation was thirty-five minutes. She went to bed in good condition, did well for two days, then developed uremic symptoms and died on the fifth day.

Case 5 was perhaps the worst subject (from the standpoint of renal disease) for a serious operation in my experience. She had been an invalid for several years, had albuminuria due to large white kidneys, and was so debilitated at the time of the operation that she had been confined to her bed for some weeks. This was one of my early operations, and I might here add that I should not operate at the present time upon such a patient for tubo-ovarian inflammatory conditions. The operation was extremely difficult and lasted forty minutes. Upon the left side, in addition to the diseased tube, a small, intraligamentous ovarian cyst, the size of an orange, was removed. When the tumor was enucleated from the broad ligament the ureter came up with it. This was separated and dropped back. It was observed to be very much thickened, and the supposition was that the woman had a surgical kidney, which proved to be the case. Suppression of urine followed the operation, and she died on the third day.

Case 6 illustrates the fact that albuminuria, and even casts, in the urine, when due to acute inflammatory conditions of the pelvis (and personally I believe that cystitis and nephritis are often induced by suppuration connected with the uterine appendages), are not a bar to a successful result after operations done for the removal of the diseased uterine appendages. Miss P., aged 19 years, contracted gonorrhea in December, 1892. She had a sharp attack of pelvic peritonitis in that month, a

second one in January, and a third one in March. In April and May she bled very freely from the womb, and when I saw her in consultation I found the bed elevated to prevent syncope. Examination showed a large, fixed mass to the right of the womb and a hard, doughy mass extending behind the womb and to the left of the pelvis. The history of the case and the physical conditions present suggested a diagnosis of ruptured extra-uterine pregnancy. It was recognized, however, that the conditions might be due to tubo-ovarian inflammatory disease. This patient's urine contained a large amount of albumin and some hyaline casts, but its specific gravity was 1.032. Operation showed a suppurating right ovarian tumor and double pyosalpinx. She made an uninterrupted recovery, passing sixteen ounces of urine the first day, fifteen ounces the second, sixteen the third, eighteen the fourth, etc. The condition of the urine is now normal.

In conclusion I would emphasize especially the following points:

1. The importance of the systematic examination of the urine of gynecological patients, especially of those requiring celiotomy.

2. That the presence of albumin and of casts in the urine need not affect the issue of the operation.

3. That serious and prolonged celiotomies involving much handling of the abdominal viscera, in women having chronic Bright's disease (especially the small, contracted kidney), usually terminate fatally.

4. That the prognosis is best when the presence of albumin and casts in the urine is due to the pressure of an ovarian cyst which can be quickly removed.

The histories of the following cases have been prepared by Dr. H. E. Applebach, assistant surgeon to the Kensington Hospital for Women:

Case I.—Mrs. V., æt. 30, IIpara; one miscarriage; menstruation regular; leucorrhea marked.

History.—Health has been wrecked through child-bearing. Has had very grave vomiting each time when pregnant, and puerperal sepsis after each labor. Is extremely prostrated.

Examination shows tender ovaries.

Operation.—Abdominal section, January 29th, 1892. Removal of both uterine appendages. Duration, half an hour. No drainage.

Course.—Interrupted by acute nephritis on third day. Amount of urine passed: first day, thirteen ounces; second day, twelve and a half ounces; third day, sixteen ounces; fourth day, thirteen and a half ounces; fifth day, three-quarters of an ounce. She made a good recovery.

Urine.—Examination prior to operation negative. The urine became normal within a month and has remained so.

CASE II.—Mrs. W., æt. 40, XIIpara; five miscarriages; irregular; leucorrhea very marked; appetite poor; bowels costive; urine 0.

History.—Health has been bad eight years. Backaches; pain in abdomen, head; hemorrhoids. Bleeding from uterus quite marked on three occasions at intervals of six weeks. Repeated fainting attacks.

Examination.—Masses in both ovarian regions.

Operation.—Abdominal section, September 4th, 1890. Removal of uterine appendages. Ovarian cyst on right side, parovarian on left side. Duration, fifteen minutes. Drainage.

Course.—Uremia set in on third day, resulting in death. Amount of urine passed: first day, twelve and a half ounces; second day, three and a half ounces during night (no report for day); third day, died.

Urine.—Examination of urine proved negative before operation.

Autopsy.—Small, contracted kidneys. No peritonitis.

CASE III.—Mrs. A., æt. 50, 0para; no miscarriage; menopause at usual time; no leucorrhea; appetite poor; bowels costive; urine scant, with albumin.

History.—Has been unwell for past four years with distressing symptoms of stomach indigestion, etc. Enlargement of abdomen noticed during past fourteen months, quite rapid the last six months. Marked loss of strength, and emaciation.

Examination.—Large right ovarian cyst.

Operation.—Abdominal section, February 4th, 1893. Removal of right appendage and tumor. Irrigation and drainage. Duration, forty-five minutes.

Course.—Uninterrupted.

Urine.—Repeated examination of the urine for two months prior to operation showed marked quantities of albumin, with few casts (hyaline) at different times, not uniformly present. The quantity averaged twenty ounces for twenty-four hours. Quantity of albumin not materially affected by treatment. On

day before operation amount of urine voided and by catheter was thirteen ounces; first day, twenty-nine and a half ounces; second day, thirteen ounces during night (frequent bowel movements prevented measuring of urine during day); third day, twenty-five and a half ounces; fourth day, twenty-five and a half ounces; fifth day, twenty-eight ounces. The quantity of urine steadily increased after operation, with diminution of albumin. At the end of four weeks, quantity of urine normal, slight trace of albumin. Two examinations since discharge of patient show negative results.

Case IV.—Mrs. M., æt. 34, 0para; no miscarriage; menstruation too frequent (painful before period); cramps; leucorrhea irregular.

History.—Has abdominal distress, headache, backache. Had six or eight attacks of pelvic peritonitis. Had two attacks of gonorrhea from husband.

Examination.—Tubo-ovarian masses on both sides.

Operation.—Abdominal section, May 7th, 1890. Anesthetic, ether. Removal of uterine appendages; adhesion very dense; enucleation difficult. Duration, thirty-five minutes. Irrigation and glass drainage.

Course.—Gradual uremic intoxication, resulting in death.

Urine.—Examination of urine negative prior to operation. After operation, quantity of urine voided ranged from eight to eighteen ounces.

Autopsy.—Small, contracted kidneys. No peritonitis.

Case V.—Mrs. R., æt. 29, Ipara; no miscarriage; menstruation regular during first week, free, not much pain; leucorrhea marked; appetite poor; bowels costive; bladder irritable.

History.—Has been an invalid for several years, marked pains in the head and womb alternating. Had inflammation of the bowels and ovaries for a year after her labor.

Examination.—Uterus retroverted. Tubo-ovarian masses on both sides, especially on right side.

Operation.—Abdominal section, March 7th, 1890. Removal of uterine appendages; adhesion very dense. Right ureter was attached to intraligamentous tumor, very much thickened; was freed and dropped. Duration of operation, forty minutes. Irrigation and glass drainage. Anesthetic, chloroform.

Course.—Suppression of urine followed operation after twenty-four hours; on second day quantity by catheter and voiding, ten ounces; on third day, one ounce by catheter; death third day.

Autopsy.—Right ureter and pelvis of right kidney dilated; large white kidneys. No peritonitis.

CASE VI.—Miss P., æt. 19, 0para; menstruation regular until the past two months, metrorrhagia since; very severe pain with last two periods; leucorrhea; history of a well-marked attack of vaginitis in December, 1892.

History.—She was a healthy girl until December, 1892, since which time she has had three severe attacks of peritonitis, and is at the present time confined to bed from pelvic soreness and from the effects of severe uterine hemorrhages.

Examination.—Vagina relaxed. Womb enlarged, pushed forward, and fixed. External os quite patulous. A large, fixed mass can be felt upon the right side of the pelvis, which is palpable above the superior strait. A doughy mass, continuous with the first, can be traced across the pelvis behind the womb.

Urine.—Examination before operation showed albumin marked; hyaline casts; specific gravity 1.032.

Operation.—Abdominal section, May 7th, 1892. Removal of uterine appendages and tumor of right ovary. Adhesions were universal, but friable. Time of operation, fifty minutes. Irrigation and glass drainage.

Course.—Marked shock when put to bed; pulse 160. She rapidly improved and made an uninterrupted recovery. The amount of urine passed: first day, ten ounces; second day, sixteen ounces; third day, fifteen ounces; fourth day, sixteen ounces; fifth day, eighteen ounces. Three weeks after operation the urine is normal.

THE OMENTUM AND THE RÔLE IT PLAYS IN OPERATIVE WORK UPON THE ABDOMEN.[1]

BY

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(With five illustrations.)

MANY of you may think the title of this paper peculiar, from the fact that it may refer either to a paper on physiology, on

[1] Read by title before the Section on Gynecology and Abdominal Surgery of the Pan-American Medical Congress.

anatomy, or abdominal surgery. I do not claim to be either a physiologist or an anatomist, but, as an abdominal surgeon, feel that we should all know more of the first structure we meet after our knife has cut through the peritoneum. The omentum has been neglected. Being, as we are, unaware of its function, we are constantly dealing with a something about which we know very little, and this ignorance may in many ways affect the results of our operations. I do not expect in this instance to arrive much nearer a conclusion, but desire to give you the outcome of some little thought on the subject. My intention is to take the question up as follows: firstly, the comparative anatomy of the omentum; secondly, the comparative development of the omentum; thirdly, the structure of the omentum; fourthly, the functions of the omentum; and, fifthly, the diseases of the omentum. There is a dearth of literature upon this subject.

Comparative Anatomy of the Omentum.—The pleural cavity first becomes differentiated from the abdominal cavity in the mammalia. While there is no pleural cavity in the pigeon, the omentum is found as a fold of mesentery, loaded with fat, covering the viscera behind the liver (Marshall and Hurst, Parker).

Wagner states that in birds the peritoneum does not develop true omenta. The intestine in birds is, however, invested by a peritoneal coat which follows its curvatures.[1] In the reptiles and birds the alimentary canal is invested by a peritoneal coat which generally follows all the curvatures of the intestine; but in the snakes the folds of the small intestine are united by fibrous tissue and enclosed by a common sheath of peritoneum. This also happens to a certain extent in the horse, two folds of bowel being frequently supplied by but one coat of peritoneum. This occurs especially in the colon, and is an interesting fact when taken into consideration with the observations made by several surgeons who have observed a total absence of the peritoneum in the human being, observed as a congenital condition, as well as a condition following adhesive peritonitis. It proves conclusively that man can live after an obliteration of his peritoneal cavity.

A small and a large omentum traversed by elegantly disposed streaks of fat, as in the otter, is regularly present in the mammalia. The insertion of the great omentum departs most from

[1] "Anatomy of the Vertebrated Animals."

that of the human adult, and resembles more that of the condition found in the human fetus—that is, in the absence of any omental attachment to the transverse colon. Lumbar omenta occur in the rodentia; these project into the inguinal canal, and are to be regarded as elongations of the peritoneal or vaginal coat of the testicle. In the females the lumbar omenta are prolongations from the round ligaments of the uterus (as in rats). In the ruminantia the great omentum forms a veil over the compound stomach; in the carnivora it lies around the intestines (Wagner). (In this connection, to depart for one instant, it is interesting to note that there is no vermiform appendix in the horse or in any of the ruminants, or in the dog or pig.)

Packard in his "Zoölogy," referring to the omentum of the cat, says that "it usually contains a great deal of fat; its principal function is supposed to be to prevent the loss of heat. The omentum is present in all mammals, but is least developed in cetaceans, being most prominent in carnivora and ruminants." From the fact that the cetaceans have so slight a development in the omentum, the theory of Packard that it is intended to prevent the loss of heat can scarcely be maintained.

In the higher fishes (the teleosteans) pyloric ceca are attached like a fringe at the junction of the stomach and the duodenum. Their function is still unknown, and it may be that, as there is no omentum, they take its place. These rudimentary omenta in fish lead one to believe that the omentum has some special function. The omentum in the rabbit is a special fold of peritoneum extending backward from the stomach and loaded with fat.

Comparative Development of the Omentum.—From a close observation of the comparative development of the omentum it is readily seen that the fetal and adult conditions vary. The fetal condition is similar to that seen in the lower order of mammals; the colon in the fetus is unattached to the omentum, and this attachment takes place subsequently. Whether the attachment has any special significance or not is a question that it is difficult to decide. The lower mammals live with an omentum that has no such attachment. It is probable that this attachment with the colon is not of any special significance. The mesentery of the hind gut retains its primitive characters in vertebrata with a short hind gut. When that portion of the hind gut which is known as the colon increases in length, as it does in

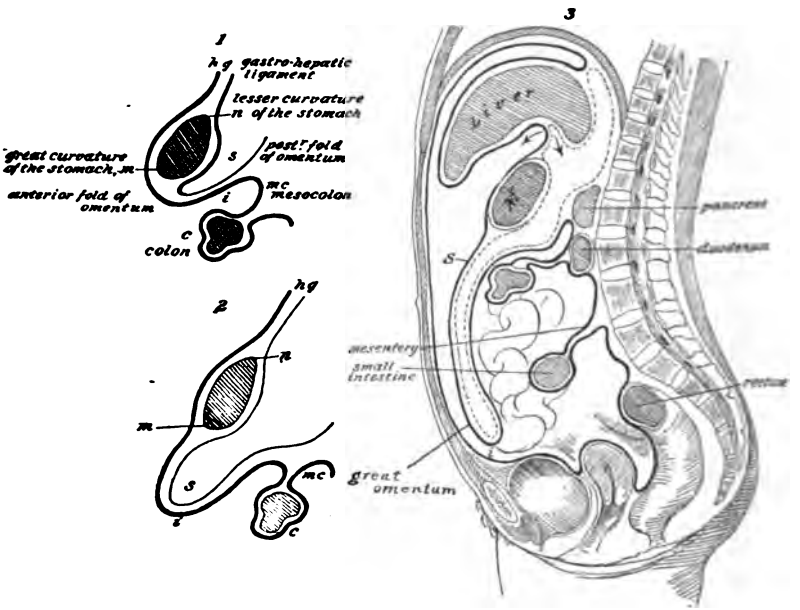
mammalia, the mesentery or mesocolon accompanies it, and is at the same time raised by one portion as far as the root of the mesogastrium, so that the two rise close together; this gives rise to that gradual connection between the mesocolon and the posterior fold of the mesogastrium which is seen in the primates, and which ends in the condition seen in man, where the transverse colon is enclosed in the hinder wall of the omental sac. At the same time the anterior and posterior walls of the omental sac grow out, and the great omentum is formed consisting of lamellæ of peritoneum (Gegenbauer).

The development of the omentum seems to show conclusively that it is intended for some important purpose in the animal economy. If it were the result of a retrograde process, as of the folding together of some membranes that had been previously prepared for some other purpose and had been left after that purpose had been fulfilled, we might conclude that it is of no particular value; but, as it happens that, as the stomach becomes more dilated and assumes more of the transverse position of the adult, it carries with it the mesogastrium from which the omentum is afterward produced, we see at once that the omentum is a subsequent formation. About the time that this change in position of the stomach takes place the mesogastrium is rapidly expanded and doubled upon itself so as to enclose a cavity, while a fold of the peritoneum connected with the liver and arising from the ventral border of the stomach, which has now become the lesser curvature, contracts around the entrance to the omental cavity behind the stomach and within the omentum so as to form a gastro-hepatic omentum and the foramen of Winslow. One of the best diagrams to show this development of the omentum I have copied from Landois and Stirling's work on "Human Physiology," and this plate no doubt shows the correct view of the development. (See page 766.)

The dorsal fold of the great omentum has not at first any connection with the transverse colon or its mesocolon, and there can be no doubt that it is only at a later period that it comes to be so closely united with them as to have given rise to the view that the transverse colon is enclosed between the two posterior layers of the omentum. This view is entirely erroneous and inconsistent with the history of the development of the omentum; what does happen is evidently a fusion of the dorsal or outer fold of the omentum with the upper layer of the mesocolon, and

this fusion takes place some time after fetal life. The peritoneum in general is developed locally by superficial delamination from the mesoblast, and not from any special layer of formative tissue (Quain).

Structure of the Omentum.—The structure of the omentum is very peculiar, and the only structures to which I can liken it are the "cerebral omenta" or the arachnoid with its fringes, the choroidal plexuses, and the "arthritic omenta" or the synovial fringes in the joints.



FIGS. 1, 2, 3.—After Landois and Stirling.

The works on anatomy seem to disagree as to the exact disposition of the membranes of the brain. Some describe the arachnoid as a membrane dividing the space between the dura mater and the pia mater into two spaces (and by doing this it certainly resembles an "omentum," and I have therefore called it a "cerebral omentum"), and others describe it as a serous membrane lining the outer side of the pia mater and the inner side of the dura mater, and thus they divide it into a visceral and a parietal layer. I believe, however, that the first description is the correct one, and the one accepted by modern anatomists. Composed, as the omentum is, of four separate and distinct layers, it

must be intended for some special purpose. The vascular supply to the omentum is very great; there is no other membrane in the body better supplied with blood. Hanging down, as it does, one might almost look upon it as an "abdominal lung"; we have here a large influx of arterial blood and a large efflux of venous blood, an immense capillary network with nothing between it and the cavity of the peritoneum but a one-cell-thick endothelium. The mouths of the lymph spaces are constantly open and ready to drain away any excess of transudation from the capillaries, that, after its transudation, becomes what is known as "lymph." These open spaces remind one of the condition present in the skin of the frog, especially that part of the skin covering the abdomen. A frog is said to absorb through these pores nearly half its weight of water within an hour. In the lung the structure is intended to bring the venous blood in contact with the oxygen of the air, and for this purpose the lung is constructed as it is. The omentum is likewise peculiarly constructed, and its purpose is in some way closely connected with its vascular and its lymphatic supply. The omentum is enormously supplied with lymph tracts; there is no other part of the body possessing a more thorough or peculiar lymphatic supply, and it seems rather strange to find this lymph supply so perfect in such a thin and apparently useless membrane.

Functions of the Omentum.—Foster likens the peritoneal cavity to the connective-tissue spaces, and considers them all as the very commencement of the general lymphatic system. Into the serous cavities the plasma of the blood exudes and becomes lymph. Whether the epithelioid linings of the large serous cavities play any distinct part in regulating the transudation of serous fluid (that is, of lymph) into these cavities we do not know. Mucous membranes are not closed sacs; serous membranes are closed sacs, and they must be subject to some "regulator" of the amount of fluid contained in them. When diseased we at once find an abnormal collection of fluid, and when that collection of fluid is removed the serous sac returns to a normal condition. Ordinary fluids that enter the tissues to keep them moist are deposited in them by an exudation from the walls of the capillaries; all surplus that is left after the requirements of the tissues have been attended to is returned by the lymphatics. In serous cavities this fluid is required for use in the cavity itself to

permit of greater freedom of movement of the contents, to prevent injurious pressure, and probably to supply a certain amount of nourishment to the parts bathed in it.

The omentum must be to some extent a protection to the intestines against injury by assisting them to glide away from the point of greatest pressure, and by preventing the formation of adhesions between the intestines and the abdominal wall. Were these adhesions to form, the intestines would be more liable to rupture during any sudden abdominal pressure. Although it is held by Foster that the villi of the choroid plexuses differ from the villi of the arachnoid in the fact that they are engaged in actively secreting fluid, they nevertheless play an important part in the regulation of the quantity of the fluid contained in the ventricles of the brain at any one time.

I have likened the omentum to the arachnoid and to the synovial fringes. There is one feature common to these three—namely, the deposition of fat. If the omentum were for the purpose of storing fat the storage should commence early, but it only begins after other tissues of the body have been fully supplied; and again, animals, such as those that hibernate, should be specially supplied with omenta, and these omenta should early put aside the fat supply for the ensuing winter. The fat of the camel, though it does not hibernate, is stored in its hump, and that of the frog in various parts of its body.

In the brain the Pacchionian glands, as they are incorrectly called, or, in other words, the villi of the arachnoid, appear to be intended for the purpose of relieving the subarachnoid space of too great a quantity of fluid, or in some way to regulate the difference between the small quantity of the fluid in the subdural space and the larger quantity of fluid in the subarachnoid space. These villi are composed of spongy trabecular tissue, and fluid injected into the subarachnoid space filters through their walls into the subdural space, and can even be driven into the interior of the venous sinuses.

The adjustment between the normal and the abnormal quantity of fluid I believe to be controlled by means of the arachnoid and its plexuses in the brain, by the synovial fringes in the cavities of the joints, and by the omentum in the abdomen. The bursæ and the sheaths of tendons, belonging, as they do, to the false serous sacs, need not be taken into consideration in the analogy, but the pleural cavity and the pericardium must be

considered. I am unable as yet to understand how this regulation of the quantity of fluid is carried out in the chest, unless in some way connected with the pump-like action of the act of respiration.

It was demonstrated by Cyon and Ludwig that when the depressor nerve was divided in the rabbit and stimulated at its central end, dilatation of the vascular district supplied by the splanchnic took place, and that district, as a consequence, held a very large supply of blood—so large, in fact, that other parts of the body were impoverished and the blood pressure, as a consequence, was diminished; but that after a time, by some compensatory action, this dilatation ceased and the blood supply again assumed its normal condition. One would think that it might readily be demonstrated by experiment that the removal of the omentum would produce a condition similar to that produced when the omentum has become functionless by the invasion of a disease; but when such compensation as that just mentioned takes place experiment is rendered more or less valueless.

Tait says that, in patients suffering from peritoneal dropsy due to disease which we now call peritoneal papilloma, a large number of cases will be found in which the effusion may be made to come and go, as the observer wishes, by merely keeping the patient in bed or out of it. In others it cannot be altered, and these are the cases in which, on exploration, it will be found that the great omentum is chiefly or very largely involved. This is Tait's statement of the case, but I am not aware that it has been observed by any other observers. From my own experience I am unable to say that I have ever noticed this effect. I have seen many cases of peritoneal dropsy accompanying malignant disease and accompanying tubercular disease, and I have seen the ascites completely disappear in some cases of tubercular disease, but have never seen it disappear in cases of malignant disease. I have frequently seen it accumulate and disappear and reaccumulate in cases of heart disease.

When we have a collection of fluid in either of the three serous cavities of the body as a result of inflammation, a special set of symptoms are observed in each case. We have a peculiar slow pulse and slow respiration accompanying meningeal inflammation, the full pulse and the high temperature accompanying pleural and joint inflammation, and the peculiar thready and

rapid pulse and low temperature accompanying the worst form of peritoneal inflammation.

I have seen the omentum so short that it was hardly worthy of the name, and I have seen it so long as to be very much in the way during abdominal operation, reaching far down into the cul-de-sac of Douglas, where it lay curled on itself. In one patient on whom I operated, who was suffering with symptoms of chronic pelvic inflammation, I found what I considered before operation to be a pus tube to be nothing more than the omentum curled on itself like a rolled pancake and tucked down into the cul-de-sac of Douglas. In another patient I found the omentum attached to an ovarian tumor and apparently infected with the gangrenous condition present in the tumor itself. I considered it advisable at the operation to remove this doubtful-looking omentum, and did so by means of a chain suture passed across its surface about six inches below its attachment to the stomach. This procedure curled the end of the omentum together and reduced its width to a very great extent. Some time after the operation the patient began to complain of pains in the abdomen, and noticed a hardness that was found to extend upward toward the wall of the stomach. I at first attributed this condition to the presence of a collection of fluid in the omentum, but how this collection of fluid was occasioned I could not satisfactorily explain to myself. I connected it with the ligation and removal of half of the omentum. As the patient went from bad to worse, I determined to do a secondary operation and to tap what I considered to be a cyst of the omentum. Serous fluid was found and evacuated by an incision made high up. The fluid re-collected, however, and I began to think that the case was probably due to an original condition of malignancy in the tumor. The tumor, at the time of its removal, did not appear to be of a malignant nature. The symptoms pointed, however, to the formation of pus. The patient lingered on for some months, and eventually an abscess opened through the line of the second incision and she immediately regained her health. This case was one of cystic collection of fluid in the folds of the omentum, with secondary suppuration in the cyst.

From this case I was first led to believe that the omentum in some way controlled the intraperitoneal currents. About this time I read a paper of Tait's in which he stated that he believed the omentum to be the arbiter of the peritoneal tides. A case

was mentioned by Tait of a cyst, evidently composed of the lesser cavity of the peritoneum, removed from a patient who had acute peritonitis and in whose abdomen a common sewing needle was found. The irritation of the sewing needle and the irritation of the silk ligature may have set up an irritation in the omentum that led to the formation of these cysts. In one case I found the omentum forced through the aperture from which a drainage tube had been removed two days before. On removing the dressings I was amazed to find nearly three inches of omentum lying on the abdomen; it was thickened to a great extent, and filled with a reddish serum, and apparently partially strangulated. I was astonished to find so much thickening in so short a time. One would almost have thought that it was endowed with some vermicular-like action and that it was able to move itself from place to place.

I have been interested to notice the manner in which the omentum seems to hasten to prevent the invasion of the general peritoneal cavity by some intraperitoneal poison. It seems to rapidly glue itself to the leaking pus tube, or the inflamed and leaking appendix, or the irritated and inflamed gall bladder, and thus to ward off a dangerous invasion of the system. It must in this way save many a life. *It is like a man-of-war ready to sail to any port in which there is impending trouble.* Can it be that the omentum is used, like the overflow sluices provided for mill-dams, to provide an extra outlet for the stream when the torrent comes? The usual channel is sufficient under ordinary circumstances, but when inflammation occurs and fluid tends to accumulate it seems as if the omentum rushes to the inflamed spot for a purpose. The immense lymphatic supply of this thin membrane must be able to carry off a great quantity of fluid in a very short time.

Irritative inflammation of the peritoneum is peculiar. When the omentum is artificially inflamed the epithelial cells proliferate, pus corpuscles form, the endothelial cells become spherical and prominent in their process of detachment from the fibrous trabeculæ. These endothelial cells become detached and are thrown into the general cavity of the peritoneum. As the process of repair goes on these endothelial cells become flattened and applied to the fibrous trabeculæ, the protoplasm becomes less granular, and they form an almost complete epithelial investment. The lymph cells are noticed,

subsequent to inflammation of the omentum, accumulated around the vessels.

The omentum is more frequently found in hernial sacs than intestine, but this can be readily accounted for. We frequently find pieces of thickened omentum in the regions of either inguinal or femoral hernia, giving rise to the idea that perhaps we have to deal with an ovary in the inguinal canal or an enlarged and inflamed lymphatic gland. Such cases are at times very confusing. At the operation nothing but a small button of thickened omentum will be found in a small hernial sac with a fairly tight constriction at the neck, producing the peculiar edematous condition of the omentum. It is only a few days since I removed nearly the entire omentum from the sac of an umbilical hernia. It had forced its way between the trabeculæ of the connective tissue in such a way that the sac was divided into subsidiary sacs, and the omentum was so firmly adherent that it could only be removed by tearing. While tearing the last portion I found that I had reached almost up to the colon. By the process of tearing, so many shreds were left that it was necessary to ligate and remove almost the entire intestinal curtain. Though the intestinal curtain may be able to deal with a considerable excess of fluid that may collect within the peritoneal cavity as a consequence of inflammatory action, there is no doubt a point reached at which this task becomes more than it is capable of performing. The peritoneum becomes inflamed perhaps more frequently than any other serous membrane in the body. The attacks of inflammation in this membrane in some women are legion, recurring and recurring at frequent intervals, but without producing death. Inflammation of the membranes of the brain and spinal cord is a very serious disease, and slight inflammation seems to be followed by the most disastrous results. When fluid is effused into the peritoneal cavity—and it is nearly always so effused, even in attacks of very slight inflammation—this fluid seems to be readily absorbed and the patient convalesces in a few days. I have on many occasions opened the abdomen of a patient who has been suffering from some form of growth, and has for twenty-four or thirty-six hours previous to the operation been suffering with pain indicative of a slight inflammatory attack, and in each case I have found a small quantity of fluid free in the peritoneal cavity, the peritoneum itself injected and showing every evidence of slight

inflammation. Had operation been delayed a day or two in these cases no doubt the fluid would have been absent.

Mr. Stenhouse, my clinical clerk, to whom I am indebted for assistance in reviewing the literature (meagre as it is) of the comparative anatomy of the omentum, in discussing the matter with me, formulated several theories. First, is the omentum primarily needed for heat? This has been already disposed of in another paragraph. Secondly, has the omentum, in its attachment to the stomach, any special function connected with the blood supply to the stomach? This is a very difficult question to answer. It may be that it holds a surplus supply of blood during the process of digestion, and that such blood, not being utilized as it is in other parts of the body, such as muscle and the liver and kidneys, deposits fat so frequently found in the omentum. This is especially found in people whose digestion is of the first order and who put on a fat supply elsewhere. Thirdly, have the additional omenta found in the most prolific class of mammals any connection with rapid reproduction? Were these only found in the female the question might be answered in the affirmative, but as they are found also in the male they can hardly be intended for this purpose. I leave the subsequent solution of these questions to others.

Diseases of the Omentum. Growths.—The omentum is subject to various forms of growths—fatty tumor, dermoid tumor, malignant growths, simple and suppurating cysts, hydatid cysts, and fibroma.

Discussing the question of tumors of the omentum, one must be careful to differentiate those tumors that originate in the omentum itself and tumors that become secondarily attached to it.

Fatty tumors have been successfully removed from the omentum. Such cases are frequently supposed to be malignant until after a microscopical examination of the growth has been made. An interesting case was recorded by Roberts, operated on in the Woman's Hospital in Philadelphia.[1] The fatty tumor in the omentum in this case was accompanied by a collection of ascitic fluid in the abdomen.

Dermoid tumors, if we are to accept the view mentioned regarding the development of the peritoneum from the mesoblast, cannot originate in the omentum itself. Sutton believes

[1] Medical News, August 22d, 1891.

that there is no such thing as a true dermoid of the omentum. He believes that dermoids within the peritoneum only occur in women and that all dermoids in men are extraperitoneal, and, further, that dermoids of the omentum are in reality dermoids of the ovary that have shifted their attachment.

Malignant disease of the omentum. Cornil and Ranvier

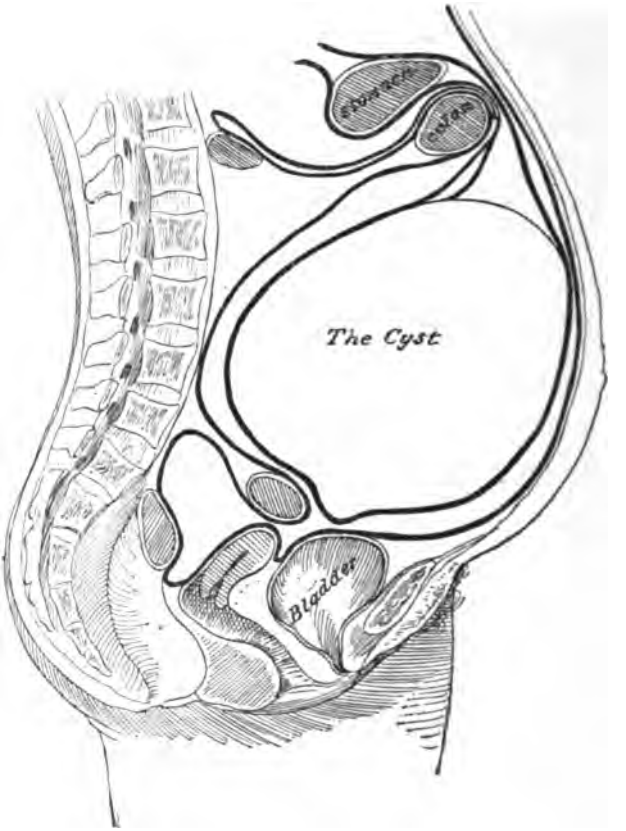


FIG. 4.—After Doran.

state that primary carcinoma of the peritoneum commences in the omentum as encephaloid or more frequently as colloid. Cylindrical carcinoma of the stomach, the intestines, the gall bladder, and the biliary ducts gives rise to secondary nodules in the liver, but without involvement of its serous covering or of the peritoneum elsewhere. In cases of cancer of the peritoneum, such as that which may affect primarily the omentum or ovary, the omentum is always affected and the peritoneum

studded with nodules that have a tendency to grow only toward the peritoneal cavity and not to affect deeper tissues. A very remarkable case of cancer of the omentum was reported by Gross.[1] In this case the omentum, or a portion of it, had apparently been protruded through an opening in the linea alba, and the portion thus protruded had taken on cancerous disease. A mass of cancer was found lying on the aponeurosis of the external oblique muscle and was connected by a rounded pedicle one-third of an inch in diameter. With the omentum the pedicle was ligated and the tumor removed. Shortly after ascites made its appearance. The patient died; no post-mortem was permitted.

Cysts of the omentum are more common, perhaps, than fatty growths or malignant growths. The cysts may be simple inflammatory cysts, suppurating cysts, or hydatid cysts. The pathology of these is not as yet well known. I show a diagram (Fig. 4) given with a case reported by Doran, operated on by Bantock. This cyst lay entirely between the two anterior and the two posterior folds of the omentum, with the mesentery of the colon and the ileum lying above and behind, and below and behind. It was adherent to the mesentery throughout part of its extent. The woman was 58 years of age. The two anterior layers of the omentum that encircle the stomach with peritoneum were found intact. The adhesions commenced below where the two folds of the posterior layer encircle the colon, and the two layers of the anterior wall passed in front of the colon to reach the stomach. In this case nothing peculiar was to be noticed. In regard to symptoms, the patient suffered for years with what was supposed to be cystic disease of the ovary. She had been tapped several times; the fluid that was removed was dark and serous. The cyst proved to be entirely within the omentum; the fold of the mesentery attached to the ileum entirely separated the tumor from the pelvic organs, where the uterus, ovaries and tubes, and peritoneal folds were normal.

Wells shows a diagram (Fig. 5), that I have reproduced, when recording a case of cyst of the omentum operated on by him.[2] The patient was a girl, aged 4, who had a large abdomen from infancy. This enlargement gradually increased and was accompanied by abdominal pains. The abdomen was found to be

[1] Transactions of Pathological Society of Philadelphia, vol. viii.

[2] British Medical Journal, June 14th, 1890.

prominent below the navel, and the prominent area was dull on percussion and fluctuating. The drawing shows a peculiar laxity of the abdominal wall below, and does not give one the idea either of the presence of pregnancy or of ovarian cyst; it has more the appearance of an abdomen filled with ascitic fluid. When lying on the back the fluid was found to be encysted; it did not rise in the loins, as it would in ascites. The diagnosis was that of ovarian disease. The fluid drawn off was nothing more than water with a mere trace of albumin; it was tapped and soon filled again. The cyst never became tense, although it

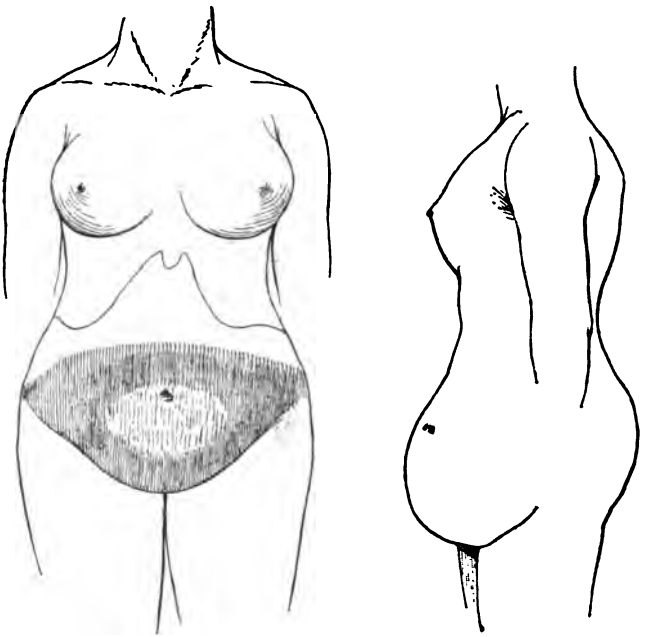


FIG. 5.—After Spencer Wells.

filled. This, I suppose, was due to the tendency it had to burrow up into the folds of the omentum. After its removal the child remained in good health.

The case mentioned in a fore part of this paper, recorded by Tait, of a cyst of the omentum removed from a patient in whose abdomen a common sewing needle was found, might point to omental irritation as a cause of the formation of such a cyst. Cysts of the omentum seem to suppurate very frequently, and this suppuration is not dependent on any surgical interference.

Pain appears to be generally present in such cases. There seems to be greater movement upward than downward, and

the movement is also lateral from side to side of the abdomen. The movements are synchronous with respiratory acts.

Hydatids of the omentum are not very common. An interesting case is recorded by Thornton. The patient had been pregnant for some months and was suffering from an obscure abdominal tumor. She looked sallow and had the appearance of one suffering from constant pain. Her health had not been good for three and a half years. She had a child three and a half years before. At that time she noticed a lump in the right side of the abdomen. As her size increased with pregnancy other lumps were felt in the lower part of the abdomen. The pain was continuous when Thornton saw her, and she was obliged to take sedatives. Emaciation rapidly increased. The pregnant uterus was found to be to the left of the abdomen; the masses to the right side had the indistinct sense of fluctuation; the pelvis was occupied by grape-like bunches of small round bodies lying behind the uterus. The tumor was supposed to be ovarian, and exploratory operation was decided on after consultation, and carried out. Some of the consultants favored the induction of premature labor, others favored immediate exploratory operation. On making an incision a white-looking cyst adherent to the parietes came into view, and, as it was impossible to reach above or below, it was cut into. It had a rough surface and looked like those false cysts that are formed by peritoneal adhesions. The nodular parts were found to be separate hydatids growing in the omentum, and its whole lower half was fringed and hung with them, from the size of a hen's egg to that of a small marble. This condition affecting the omentum is an extremely rare one.

I have found no record of *chylous cysts of the omentum*, though such cysts are common in the mesentery. My references have been taken from the "Index Medicus." Such cases may have been reported and have escaped my observation. If chylous cysts of the omentum do not exist, the fact would be an interesting one when taken in connection with the fact that they are common in the mesentery.

Fibroma has been found in the omentum. A case was recorded in the Transactions of the Pathological Society of London, 1891–92, volume xliii.

Gangrene of the Omentum.—A case of gangrene of the omentum has been mentioned, and a specimen was shown by Pitt to

the Hunterian Society at the meeting on the 28th of March, 1889. Extensive sloughing of the omentum was found, and this had evidently set up a fatal peritonitis. The patient was a man who, while under the influence of liquor, fell in the road. It was not known whether he was trodden on by a horse or otherwise injured. A small tear was found in the omentum, from which no hemorrhage had taken place. As a perforation was found in the ileum in this case, it is difficult to say whether the lesion in the ileum caused the gangrene in the omentum, or the gangrene of the omentum was the primary lesion.

Obstruction of the mesenteric artery and vein has been noted,[1] and was followed by an intestinal hemorrhage. One can easily see how a gangrene of the omentum might occur, and this fact is perhaps of considerable importance to the abdominal surgeon. I fear that sometimes we are tempted to remove the distal portion of omentum, after ligature of the part nearest the body, at too great a distance from the ligature, and thus to favor death of the distal portion.

Hemorrhage into the mesentery has also been noted. This subject was brought prominently forward in 1881, when several cases were reported to the Medical Society of London.[2] As such hemorrhage may occur in the mesentery, there is no reason why hemorrhages may not also occur into the folds of the omentum. I have not seen any such cases reported except as the result of injury.

Regarding *wounds of the omentum*, Greig Smith says that they are occasionally attacked with free bleeding, and that this free bleeding may form a large hematoma between the layers. In such cases complete amputation of the omentum above the site of injury would be the best treatment. A small perforation without bleeding should be excised to prevent the risk of gangrene, and the opening should be closed by a continuous suture.

Tubercular deposit frequently takes place in the omentum, but is then only part of a general tubercular peritonitis. It may be thickened so as to form a prominent hard tumor that may be readily felt by palpation over the abdomen, and, as it is accompanied by ascites, may give rise to the idea that the disease is malignant. Omental bands have been known to produce obstruction of the intestine. Such bands are perhaps among

[1] Path. Society Trans., vol. xxxii. [2] Lancet, December 1st, 1881.

the common causes of internal strangulation. A coil of intestine has been known to slip through a tear in the omentum.

Inflammation of the Peritoneum.—There is no doubt that in many cases of inflammation of the peritoneum the omentum becomes studded with colonies of leucocytes or small round cells that thicken it and that also form nodules that can with difficulty be distinguished from the granulations of tubercle. Tubercle and malignant disease have a tendency to be deposited in this way in colonies, not only on the omentum, but over the entire surface of the peritoneum.

In a description of a cyst of the omentum Ransom describes the condition found by the microscope as clearly indicative of the inflammatory origin of the cyst. In reading the history of a case recorded by Wells one must conclude that, owing to the presence of the small fluid-like grapes, the cyst was undoubtedly of inflammatory origin. I have seen these fluid-like grapes in the abdomen on several occasions, and they have only been found in cases in which the parts were firmly matted by adhesions left by former attacks of peritonitis.[1] Peritonitis is a disease to which dogs are little subject. Even wounds which in horses and other animals result in inflammation of the peritoneum, in dogs heal kindly (Stables). Whether such peculiarities are connected with differences in the anatomical distribution of the intraperitoneal contents or not I leave for others to decide.

481 SHERBOURNE STREET.

COMPARATIVE MICROSCOPICAL STUDIES OF THE OVARY.

BY

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(With eight illustrations.)

II. THE RESULT OF OVULATION IN THE OVARY.

THE authors who have done most for an apparently accurate description of the tissue changes in the human ovary due to menstruation and ovulation are Bischoff, Dalton, and Leopold.

[1] See paper on "Cystic Disease of the Peritoneum," American Association Journal, 1892.

Bischoff's observations are criticised by Leopold, who, out of the fourteen cases of Bischoff, admits only two as worthy of attention, and in even these the dates of menstruation could not be given with certainty.

Dalton, according to Leopold, has made five accurate observations, out of which three are doubtful on account of epilepsy and mental disturbances. Leopold considers only two cases of Dalton trustworthy, one of the twentieth and one of the twenty-sixth day.

For me remains the criticism of Leopold's above-quoted article, in which forty pairs of ovaries were described, out of which in twenty-nine cases only could be given exact dates as to menstruation. These ovaries, Leopold claims, came mostly fresh into his hands and were not altered by post-mortem changes.

In analyzing the cases of Leopold we meet with rather strange facts, illustrated profusely by elaborate colored plates, and it is well worth our attempt at selecting a few of his cases for closer analysis.

I will first discuss Case 1, which is claimed to show a menstrual body of the first day, since castration was performed on the first day of menstruation. The reason for castration was severe, constant pain, exaggerated at the time of the periods, in a nullipara 21 years of age. The right ovary is described as containing a freshly burst, collapsed follicle, not yet completely filled with blood, surrounded by a fluted wall of one to one and a half millimetres in thickness, presenting on the surface a gaping opening of the size of a millet seed. The illustration shows a body containing a blood clot of a configuration and size never assumed by any ripe follicle. The opening on the surface Leopold himself considers as a dubious feature, since he admits the possibility that the thin-walled cavity may have burst in consequence of manipulations attending the extirpation of the organ. Wherefrom, may I ask, is the heavy wall around the clot, surpassing in its thickness considerably that of the wall of a ripe follicle?

It is plain to me that Leopold did not have before him a recently burst follicle, but a morbid formation which I have previously described as an endothelioma changing to hematoma. It is plain, furthermore, that this hematoma was the cause of the suffering of the woman, on account of which castration had been performed.

In Fig. 3 a corpus menstruationis is described of the third day of a virgin 20 years old, of strong constitution, who died from the effects of injury. The left ovary is at one pole transformed into a so-called corpus luteum occupying the whole breadth of the ovary, with a cortex of brownish-black color and a lighter, serrated nucleus, apparently the result of beginning of absorption of the extravasated blood. Again I am positive that this formation was nothing but a hematoma of considerable size, which in this instance did not cause serious symptoms.

As a corpus luteum of the twelfth day Leopold describes the left ovary of a nullipara of 40 years whose ovaries were removed for constant pain in the pelvis, aggravated at the time of menstruation. Here we have a hematoma the size of a cherry, with distinctly serrated borders toward the central cavity, from which the blood has escaped to the surface from a narrow slit. Another ovary with similar features is described as a corpus luteum of the twelfth day, an apparently identical one, as being due to menstruation fifteen days ago.

Leopold describes and illustrates as "corpora lutea spuria" of the twenty-first, twenty-third, twenty-fourth, and thirty-fifth day, formations, some of the size of cherries, with a distinct convoluted border, such as I have described as gyroma changing to endothelioma and hematoma—formations which must be considered as thoroughly pathological and in no connection whatsoever with the preceding menstruation. There is no proof furnished by Leopold that these bodies were the outcome of ovulation of the special dates, hence all his conclusions I must consider fallacious.

Before entering upon the subject of my paper I will, in short, express the view I have taken on this point. It is based on the result of researches carried on in cases in which I could positively say when the last menstruation had occurred, in ovaries which were not removed for oöphoritis but in connection with hysterectomies.

I am convinced ovulation produces in a perfectly healthy ovary no such body as a corpus luteum, but simply a small, insignificant hemorrhagic spot in the cortex of the ovary; while in ovaries pathologically altered a growth may result which resembles the corpus luteum of pregnancy, but which, in contradistinction to this, should be called, according to its structure, endothelioma. A closer inspection of this hemorrhagic spot shows an area of

purely myxomatous tissue surrounded by a structureless, folded-up wall, identical with the subepithelial, structureless membrane of the Graafian follicle. The myxomatous tissue is in turn changed to medullary tissue, from which arises at first myxo-fibrous, at last fibrous cicatricial tissue, still holding the collapsed and structureless membrane, which, in some instances at least, seems to remain unchanged for life.

In order to satisfy myself still more about the correctness of this view, I thought it best to enter comparative studies in the ovaries of various animals, such as cow, sow, ewe, cat, and guinea-pig. Nowhere did I have a chance to study the first changes due to ovulation in the ovaries of the animals mentioned, but I had invariably either follicular remnants before me or secondary metamorphoses thereof tending toward retrogressive changes. I have met with such formations in the ovaries of all these animals in large numbers, so much so that I have good reason to consider them normal altogether. Whereas gravidity invariably causes the production of a corpus luteum, whose progressive and retrogressive changes I have already described, I have never met with similar formations in ovaries of non-pregnant animals. Both corpora lutea in varying number and follicular remnants due to ovulation may be encountered in one and the same ovary, so much so that the possibility forced itself upon my mind that ovulation does not cease during gravidity, although for obvious reasons we do not succeed in determining the age of the products of ovulation.

A burst follicle is a tissue gap, first filled with blood and coagulated fibrin, healing in a perfectly normal process in exactly the same manner as an artificially produced loss of substance. The first outcome of the rupture of a Graafian follicle is a reactive inflammation not only in the remnant of the zona granulosa, but also in the immediate vicinity of the burst follicle. The only formation which in many instances escapes inflammatory changes is the so-called structureless membrane located between the epithelia of the zona granulosa and the freely vascularized fibrous connective tissue ensheathing the follicle, and known since De Graaf by the name, theca folliculi. As at the bursting of the follicular wall the structureless membrane itself must be ruptured, perhaps even at several points, we readily understand the ingrowth of the tissue, through the gaps in the structureless membrane, into the cavity of the collapsed follicle. The

first traceable tissue growing into this cavity from without is medullary or embryonal tissue, from which myxomatous tissue arises, at first but scantily supplied with basis substance, later marked by the presence of a protoplasmic network, the meshes of which contain myxomatous basis substance and a single protoplasmic body in the centre of the mesh.

The strangest feature is the so-called structureless membrane that encloses the myxomatous tissue. I have seen this membrane in all animals mentioned above except the cat. It is more or less convoluted or folded up, corresponding to the collapse of the follicle at ovulation. Its breadth is, however, considerably at variance in different animals, as well as in different follicular remnants of one and the same ovary. From what I have seen I can positively maintain that the term structureless is erroneous. Already in human beings I have met with inflammatory changes in the membrane under consideration, proving the possibility of its being transformed into medullary tissue. In animals we frequently meet with perforations of the membrane serving for the interconnection of the central myxomatous with the outer fibrous or myxofibrous tissue. If allowance is made for a possible rupture of this membrane at the time of ovulation, as previously mentioned, still there are instances where the membrane itself is transformed into protoplasmic or medullary tissue, by means of which the original membrane is led to dissolution and final disappearance. On the other hand, we meet with so-called structureless membranes of considerable breadth, nay, with apparently structureless patches of considerable refraction, in the midst of myxomatous tissue, which fact would prove that the structureless membrane may be increased in bulk by the inflammation supervening the rupture of the follicle.

With these preliminary remarks I now proceed to the description of the remnants of follicles due to ovulation in different animals. Fig. 1 represents the remnants of a follicle in the ovary of the sow × 125.

We see a beautifully developed myxomatous tissue in the centre of the follicle, whereas toward the structureless portion there is still a pronounced stage of indifferent or of medullary formation. The structureless membrane surrounding the myxomatous tissue is conspicuous by its breadth; the convolutions are not very marked. The portion R is probably a remnant of another follicle, although imperfect; but, watching its cen-

tral portion, we see only medullary tissue, a fact indicative of the progressive infiltration of the medullary tissue with an elastic or hyaloid substance, leading to a gradual increase of the breadth of the original follicular membrane. This latter is pierced by a number of radiating, protoplasmic formations, though entirely destitute of blood vessels. In the immediate vicinity of the follicular remnants we see an inflamed area in an early stage of development—so-called medullary tissue; whereas outside of this we meet with comparatively little changed ovarian tissue, consisting mainly of bundles of smooth muscle fibres

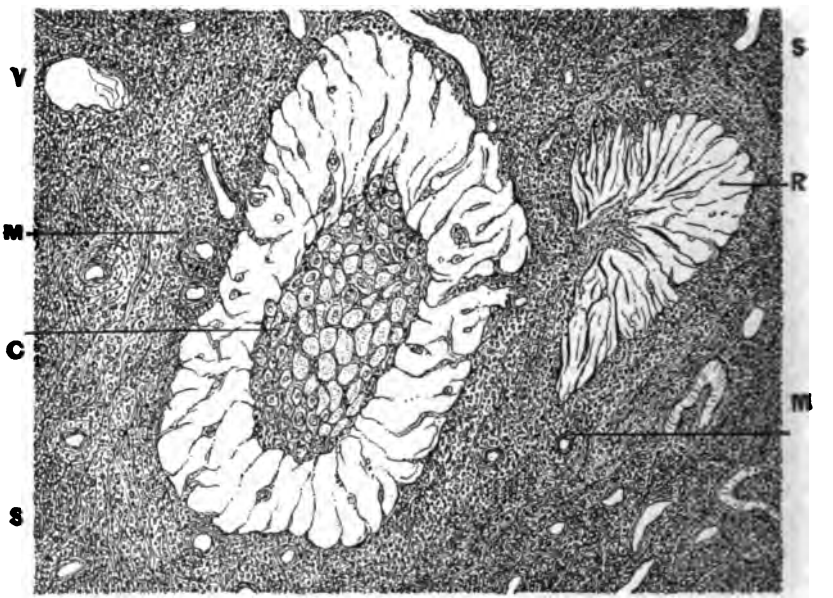


FIG. 1.—Ovary of sow. Remnants of follicle after ovulation. × 150. R, remnants of follicle in hyaloid infiltration; C, myxomatous tissue in centre of follicular wall; M, M, myxomatous embryonal tissue; V, vein in transverse section; S, S, smooth muscle fibres in transverse and longitudinal sections.

and blood vessels. This remnant was found in an ovary holding also corpora lutea of pregnancy. I mention this fact in order to hint at the possibility that the follicular wall has been augmented in bulk under the influence of a considerable irritation that has led, in other follicles, to the appearance of true corpora lutea. Here is a possibility of ovulation going on during the pregnancy of animals. In all sections made from the ovaries of the sow I have seen an abundance of formations similar to those illustrated in Fig. 1. Many of them, however,

exhibited changes which I consider retrogressive. In the vicinity of the corpus luteum or of ripe Graafian follicles the follicular remnants are narrow, as if compressed, though not essentially differing from those just described.

Fig. 2 illustrates the remnant of a follicle found in the ovary of a guinea-pig. I have selected this formation for drawing because it comes nearest to the image of a collapsed follicle in the human ovary. The structureless membrane enclosing the central myxomatous tissue is conspicuous by its convolutions and the interruptions in its course, through which the myxoma-

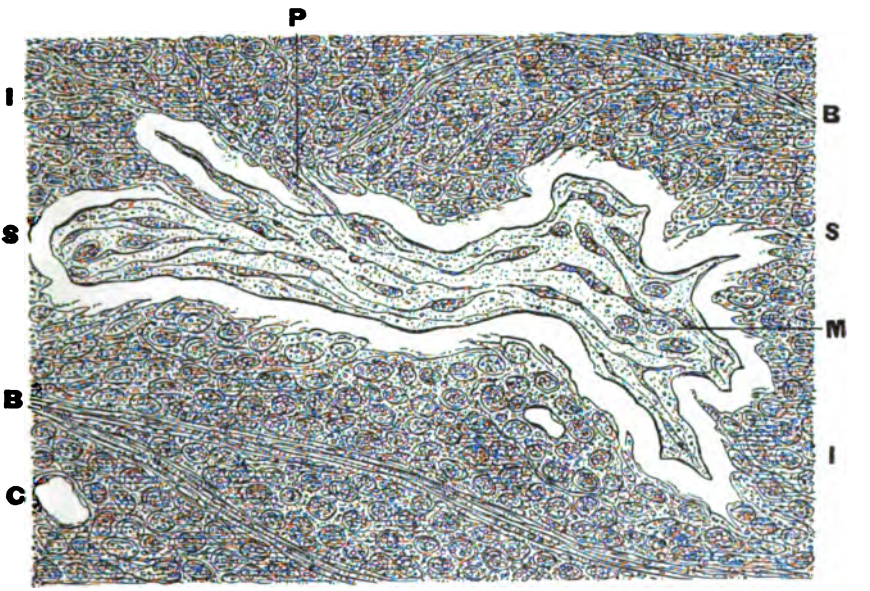


FIG. 2.—Ovary of guinea-pig. Remnants of follicle after ovulation. × 300. S, S, folded-up structureless membrane; M, myxomatous tissue within the follicular space; P, perforation of follicular membrane; I, I, indifferent tissue of the ovary, traversed by B, B, bundles of smooth muscle fibres; C, capillary blood vessel.

tous tissue of the follicle is directly connected with the outer medullary tissue. Around the structureless membrane we observe in many places a paling of the medullary tissue, possibly a low degree of infiltration with elastic or hyaloid substance. The medullary condition of the stroma of the ovary is a pronounced feature in the guinea-pig, since large fields are found undergoing the same change.

As the ovary under consideration contained a corpus luteum verum, possibly the irritation of the tissues has led to the trans-

formation of the ovarian stroma on a large scale into medullary tissue. Formations as just described are not numerous in the guinea-pig's ovary. Instead we quite frequently meet with patches of myxomatous surrounded by medullary tissue. These patches are usually of an elongated shape, especially when wedged in between corpora lutea or between ripe follicles.

Fig. 3 shows the remnant of a follicle found in the ovary of an ewe. This is taken in order to show patches of elastic basis substance in the midst of the central myxomatous tissue. At the same time the follicular wall exhibits in many places a

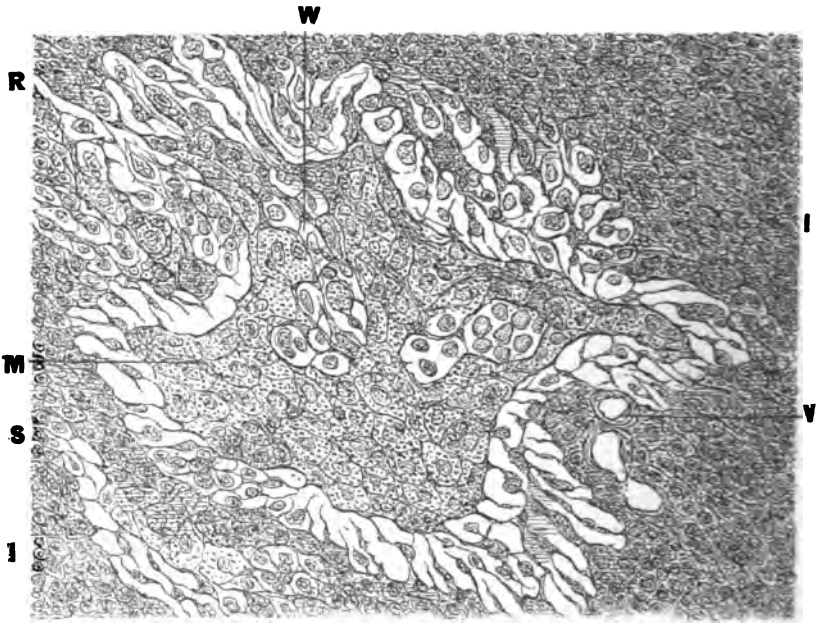


FIG. 3.—Remnants of ovulation in ovary of ewe. Beginning transformation into medullary tissue. × 400. R, folded remnants of structureless membrane; M, myxomatous tissue filling the centre; W, hyaloid masses in the myxomatous tissue; S, hyaloid masses outside the structureless membrane; I, I, medullary or inflammatory tissues; V, capillary blood vessel in transverse section.

transformation into protoplasm to such a degree that I do not hesitate to term this a retrogressive metamorphosis, a transformation of an originally bulky follicular membrane into medullary or indifferent tissue. Obviously such a change will lead to a gradual disappearance of the structureless membrane. Even in the surrounding tissue we meet with apparently isolated fields infiltrated with an elastic basis substance, but even these fields are being transformed into medullary tissue. The sur-

rounding stroma is advanced in a progressive change toward myxofibrous tissue, which proves to me that the follicular remnants under consideration are of an older date. I am, however, unable to give even an approximate figure as to the age of these follicular remnants.

Still further advanced in a retrogressive change is the follicle taken from the ovary of a cow, drawn in Fig. 4.

Nothing but a mass of the so-called structureless type is seen, freely traversed by protoplasmic tracts branching and interconnecting. The proof that we have before us a follicle of com-

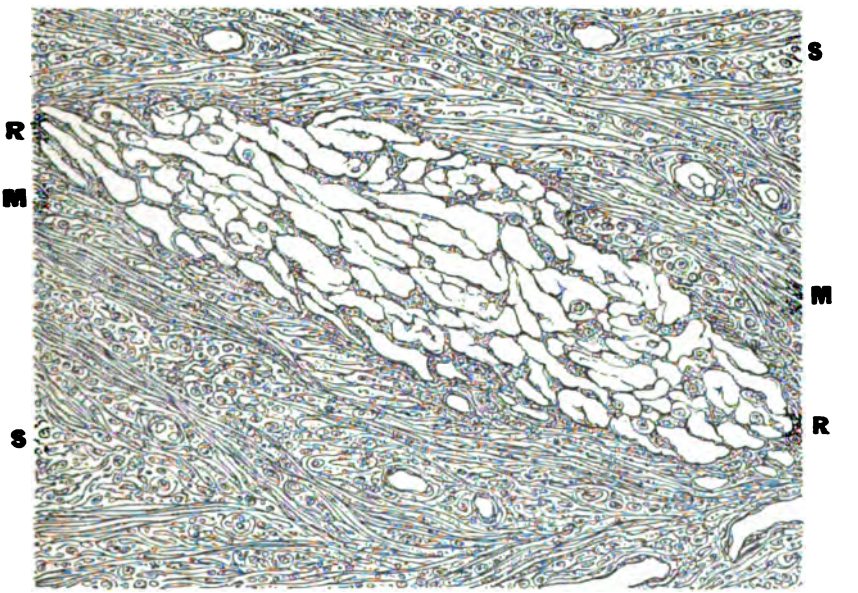


FIG. 4.—Ovary of cow. Breaking-up of follicular remnants to medullary tissue. × 150. R, R, remnants of follicle, in hyaloid infiltration, traversed by numerous branching protoplasmic tracts; M, M, myxofibrous tissue, adjacent to follicular remnants; S, S, bundles of smooth muscle fibres, in longitudinal, oblique, and transverse sections.

paratively old date is furnished by the surroundings of the hyaloid patch, which are far advanced in the formation of myxofibrous tissue. The possibility cannot be denied that the hyaloid patch will at last be transformed, first into protoplasm, next into medullary, still further into myxofibrous, and at last into fibrous connective tissue, with a complete disappearance of the hyaloid mass and the cicatricial tissue as the last remnant of a burst follicle. Indications of such gradual changes are seen

in the drawing, when we progress from the hyaline patch toward the periphery. This would correspond with observations in the human ovaries, some of which retain the so-called structureless membrane for life. In the latter instance we have an easy guide to locate the previous follicles. Should this follicular remnant completely disappear, nothing will be found but more or less extensive areas of myxofibrous or fibrous connective tissue, destitute of bundles of smooth muscle fibres, indicating the process of ovulation in years long gone by.

The cow's ovary is richly supplied with fully developed fol-

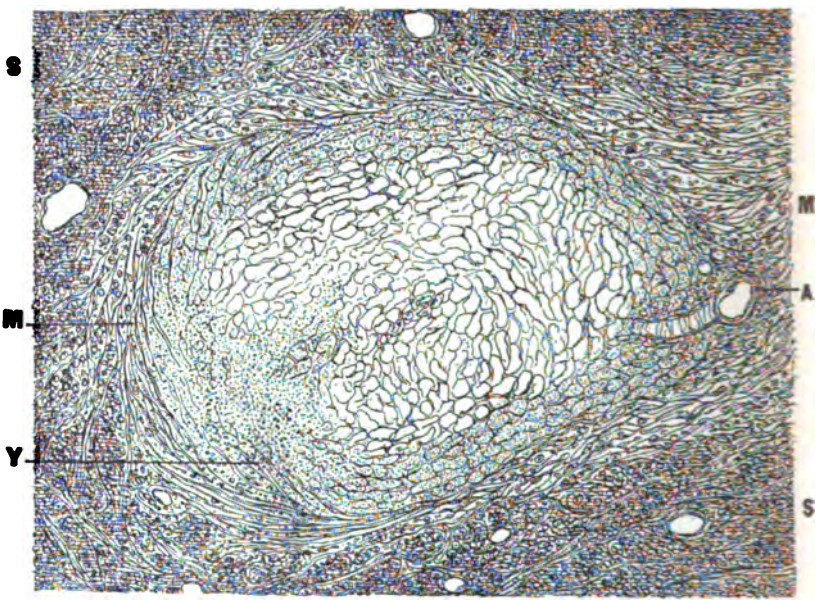


FIG. 5.—Ovary of sow. Last remnants of follicle after ovulation. × 150. Y, yellow zone at the border of the tissue in hyaloid infiltration; M, M, myxofibrous tissue around the follicular remnants; A, artery; S, S, smooth muscle fibres in transverse and longitudinal sections.

licular remnants, representing a structureless, folded-up wall enclosing cicatricial connective tissue, not differing materially from those of the sow.

From my description of the follicular remnants of different animals, it is plain that the so-called structureless membrane is found best developed in comparatively fresh follicles, whereas it is gradually transformed first into medullary, afterward into fibrous tissue when the follicular remnants are about to disap-

pear in order to be replaced finally by cicatricial fibrous connective tissue. We therefore are not surprised at meeting occasionally with follicles in which either small and indistinct remnants or no traces at all of the structureless membrane are discernible. The myxomatous tissue filling the centre is, under these circumstances, surrounded by a wreath of medullary or indifferent corpuscles or by myxofibrous tissue.

Now and then even the central myxomatous tissue is absent and replaced by medullary tissue, although even here we have no difficulty in discriminating between a small Graafian follicle cut at its periphery and a follicular remnant. Once I have seen in the ovary of the sow a peculiar formation, illustrated in Fig. 5.

The whole centre was occupied by pale, colorless cakes, evidently far advanced in hyaloid infiltration, while the border exhibited similar formations of a distinct yellow color, possibly due to the pigment of the originally escaped blood. Since in this location both the myxomatous tissue and the structureless membrane are absent, one may ask, What has entitled me to term this formation a follicular remnant? My answer is that the surrounding myxofibrous tissue, which extends a goodly distance into the adjacent ovarian stroma, is a typical outcome of the retrograde change of a burst follicle—so typical, indeed, that the presence of this tissue alone suffices for the diagnosis of a previous burst follicle, even though all remnants of the follicle had disappeared. It seems that the hyaloid or basis elastic substance infiltrating the so-called structureless follicular membrane may remain even after the dissolution of the latter, and cause eventually an infiltration of the medullary tissue filling the centre of the follicle. This seems to me the only explanation of formations as depicted in Fig. 5.

The diagnosis of a previous follicle is, as a matter of course, facilitated by the presence of remnants of the structureless membrane.

In the ewe's ovary I have met with follicular remnants characterized by a distinct follicular membrane, though never so broad as in the ovary of the sow, often containing but a narrow layer of myxomatous tissue. There is no doubt that the follicular membrane is in this animal likewise invariably present, and seen as long as the follicular remnants are of a comparatively recent date. Again we observe the follicular membrane

gradually returning to a protoplasmic condition for the production of a myxofibrous and fibrous tissue, appearing together with the loss of the follicular remnants proper. Such a change is illustrated in Fig. 6.

In this remnant portions of the central myxomatous tissue are still discernible, whereas the peripheral portions of this tissue are broken up into an indifferent medullary tissue, conspicuous by a goodly number of newly formed arteries, veins, and capillaries. The surrounding tissue is composed of myxo-

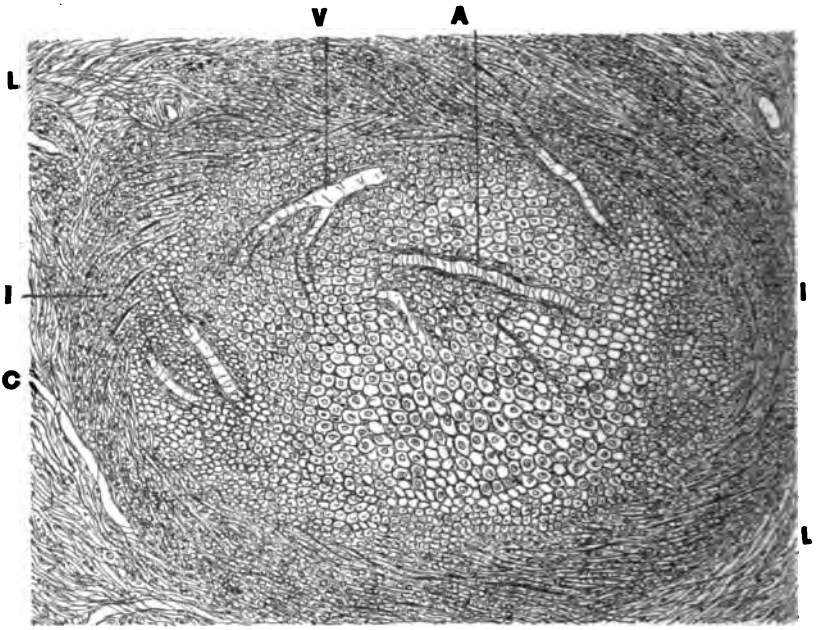


FIG. 6.—Ovary of ewe. Breaking-up of follicular remnants to medullary tissue. × 150. I, I, dense medullary infiltration of previous wall of follicle; L, L, loose fibrous connective tissue encircling the previous follicle; A, arteriole; V, vein in the central myxomatous tissue; C, capillary at the border of the previous follicle.

fibrous connective tissue, which again has changed into fibrous cicatricial tissue at the outermost environs of the previous follicle. There is no doubt that this follicle was originally enclosed by a structureless membrane, which in turn had fallen back into a stage of indifference by the reappearance of an embryonal tissue. In this animal we likewise may meet with comparatively unchanged vestiges of the structureless membrane, while the greatest portion of the previous follicle is far advanced in a retrograde process.

The cat whose two ovaries I have studied was a sickly-looking animal, having had a litter for the first time. We find here an exception as regards the construction of the follicular remnants. Although I have carefully looked over a large number of specimens, I have failed to discover a structureless follicular membrane. Instead I have quite frequently met with formations similar to that illustrated in Fig. 7. The central myxomatous tissue is fully developed, exhibiting a cavity such as we often find in the myxomatous follicular tissue in other

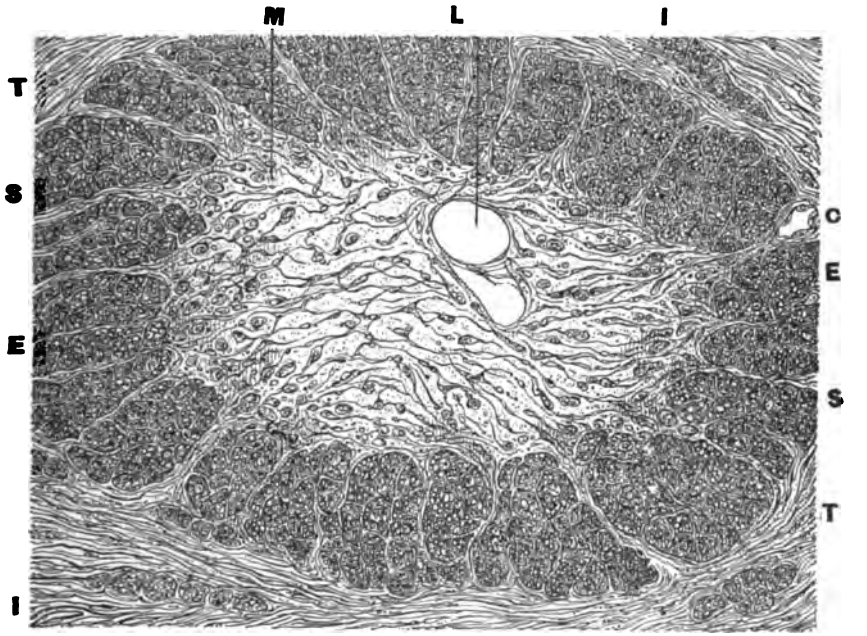


FIG. 7.—Ovary of cat. Remnant of follicle after ovulation. × 300. E, E, endothelia, coarsely granular and saturated with hemoglobin, producing the wall of the follicle; M, myxomatous tissue filling up the centre; L, cavity filled with liquid (vessel?); T, T, fibrous connective tissue around the follicle; S, S, septa of fibrous connective tissue between the groups of endothelia; C, capillary blood vessel in a septum; I, I, isolated clusters of endothelia.

animals. Such cavities I would consider as cysts due to a liquefaction of the myxomatous tissue, so frequently observed in the umbilical cord. Since the cavity is not lined with epi- or endothelia, I cannot call these cavities either cysts proper or blood vessels. The periphery is made up of a comparatively broad zone of polyhedral bodies arranged in groups, separated from one another by septa of delicate fibrous connective tissue. The

polyhedral bodies are of a distinct yellowish-brown hue, as if saturated with the coloring matter of blood; they have nowhere taken up the carmine stain. I do not hesitate to consider these polyhedral bodies as endothelia similar to those building up a corpus luteum of pregnancy, though nowhere containing fat globules, so abundant in the endothelia of the corpus luteum of this animal.

Clusters of such endothelia I have found embedded in fibrous connective tissue, not only in the immediate vicinity of the follicle, but throughout the stroma of the cortex of the ovary.

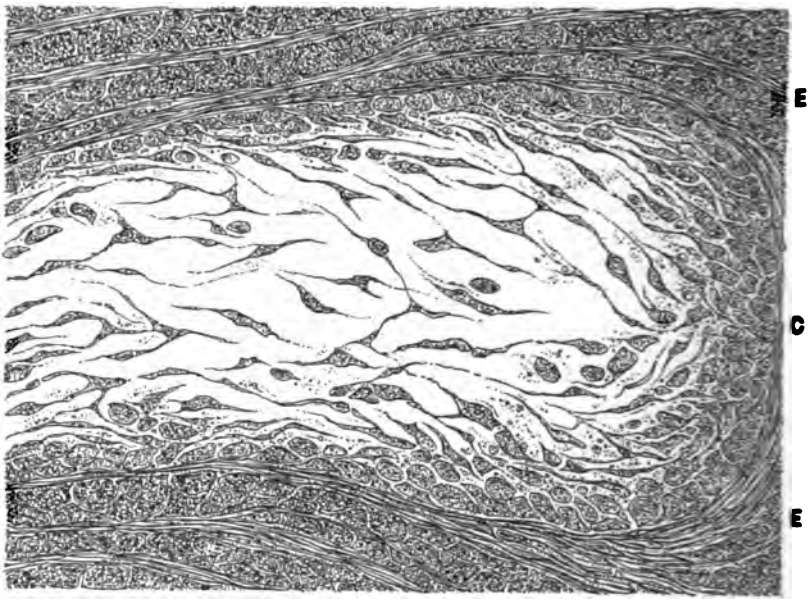


FIG. 8.—Ovary of cat. Remnants of follicle after ovulation. × 300. M, liquefied myxomatous tissue filling the follicular cavity; R, R, rows of medullary corpuscles along the wall of the cavity; C, follicular wall, made up of dense fibrous connective tissue; E, E, coarsely granular endothelia outside the follicle.

Not all of these clusters can be considered as follicular remnants, but on close analysis of the specimen we arrive at the conclusion that these endothelia are the outcome of ovulation, either or not followed by pregnancy. It seems that ovulation has, in our cat, led to considerable irritation of the ovarian stroma, together with considerable escape of blood—so-called hemorrhagic infarctus. The irritation has led to the production of a medullary tissue composed of polyhedral endothelia; the

hemorrhage, on the contrary, to the saturation of the endothelia with the coloring matter of the red blood corpuscles.

Once I have observed in the cat's ovary a peculiar elongated formation which I would likewise consider a follicular remnant, illustrated in Fig. 8.

Here we see rows of medullary corpuscles, destitute of color, surrounded by bundles of a dense fibrous connective tissue; between these, rows of polyhedral endothelia, quite conspicuous by their yellowish-brown color. The centre of this formation contains branching, partly interconnecting protoplasmic bodies, such as we are wont to observe in myxomatous tissue generally. The branching bodies, however, are pushed apart by an intervening colorless and structureless substance, evidently not basis substance proper, but a liquid derived from this substance. I confess to be unable to say whether this formation is normal or pathological; if the latter be the case, the diagnosis of an incipient cyst from a burst follicle would be in order.

The results of my researches may be condensed into the following paragraphs:

1. Whereas ovulation followed by pregnancy causes the production of a corpus luteum, which I have shown to be an endothelioma, ovulation without pregnancy will never cause the appearance of a corpus luteum or endothelioma.

2. In the cow, the sow, the ewe, and the guinea-pig the burst Graafian follicle, being first filled with blood, will in turn be filled with myxomatous tissue and be enclosed with a structureless layer, possibly the subepithelial follicular membrane.

3. Not infrequently the structureless layer, perhaps because of an infiltration with an elastic or hyaloid basis substance, is very broad, far in excess of the central myxomatous tissue.

4. Broad follicular membranes cannot be unchanged subepithelial layers, but must be due to a new formation of tissue from the medullary stage to a more or less perfect infiltration with hyaloid basis substance.

5. In the cat's ovary there are no follicular membranes, but, instead of these, broad layers of endothelia enclosing the central myxomatous tissue.

6. After a certain time the follicular membrane, or the layers similar to it, are, by a retrogressive change, transformed into an indifferent or medullary tissue. This change may take place in the whole follicular membrane or in portions of it.

7. The central myxomatous tissue is likewise transformed to indifferent or medullary tissue.

8. From the medullary tissue, the outcome of both the follicular wall and the central myxomatous tissue, a new type is developed, known by the term of myxofibrous connective tissue.

9. The myxofibrous tissue in alternate portions falls back to the stage of protoplasmic indifference, and at last gives rise to a dense, delicate, cicatricial fibrous connective tissue.

10. The cicatricial fibrous connective tissue remains unchanged throughout life, and is the last remnant of a burst follicle. It may contain apparently structureless vestiges of the follicular membrane or may be entirely destitute of the latter.

39 WEST 52D STREET.

A CASE OF PROTRACTED GESTATION—DELIVERY ON THE THREE HUNDRED AND EIGHTY-NINTH DAY.[1]

BY

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Washington, D. C.

THAT gestation may be prolonged beyond the usual period of forty weeks is a fact accepted by most of the profession. But even among those who concede the possibility of such an occurrence there is a wide diversity of opinion as to how long the protraction may last. There is, of course, a limit to the time of gestation, but it is not in our power to accurately determine it. The question is one of great importance, involving, as it frequently does, not only the reputation of a woman, but the legitimacy of her offspring as well, so that the publication of well-authenticated cases of pregnancy prolonged beyond the normal period is of general interest. In many countries arbitrary limits of the term of gestation have been fixed by law, so that if a woman carries a fetus beyond these limits the child, *ipso facto*, is declared illegitimate. The extreme limit is set by the Scottish law at 300 days. The French code fixes the same limit for France. Austria also adopts the 300-day limit, while in Germany,

[1] Read before the Medical Society of the District of Columbia, October 11th, 1893.

according to Taylor's "Medical Jurisprudence," the extreme limit is 301 to 308 days. In England and America no limit is fixed by law. In this country a child born after a pregnancy of 317 days has been declared legitimate, while in England one child born after 299 days and another born after 336 days were pronounced illegitimate. Leishman, speaking of these legal limits, says: "Difficult as it is, and always must be, to fix precisely the limit, we are inclined to think these laws just; for while it is the object of the laws, from one point of view, to protect innocent offspring from the brand of illegitimacy, if it be possible to do so, it is in like manner the duty of those who administer the laws not rashly to confer the position and privileges of legitimacy upon the fruit of adulterous intercourse."

The great stumbling block in the way of ascertaining the duration of pregnancy has always been the difficulty of fixing the date of conception. Naegeli's method was to count seven days from the first appearance of the last menstrual period, and then reckon backward three months; and in the "American System of Obstetrics" we find this statement: "Experience teaches that in woman the average apparent duration is 10 lunar months, 40 weeks, or 280 days from the beginning of the last menstruation." The uncertainty of all methods which are based on the suspension of the menstrual function is obvious, but we are forced to accept this starting point in lieu of a better one.

In spite of the arbitrary limits fixed by certain countries, and in spite of the decisions of the courts in those countries which have no limits, there are nevertheless many well-authenticated cases which show that pregnancy may be prolonged far beyond the normal duration. Simpson[1] reports three cases which went beyond 317 days—one at 319 days, one at 324 days, and one at 332 days—while he also records one at 336 days, the duration of the case in which an English court declared the child illegitimate. I find, upon looking over the records, that at the meeting of the Obstetrical Society of New York on May 6th, 1879, a case of prolonged gestation was reported by Dr. Chamberlin in which labor came on at 336 days, and Dr. Mundé, at the same meeting, reported a case of 341 days. In the *Boston Medical and Surgical Journal* of March 3d, 1881, Dr. J. M. Merchant, of Warren, R. I., reported a case extending 324 days from the

[1] Simpson, "Obstetrical Memoirs," p. 84.

last known intercourse. Dr. L. Mervin Maus, U. S. A.,[1] records a case of pregnancy prolonged 334 days, when a male child was born weighing nine pounds. In THE AMERICAN JOURNAL OF OBSTETRICS for April, 1879, Dr. Henderson, of Cincinnati, records a case where gestation was apparently prolonged to fifteen months. After a tedious and painful labor the woman was delivered by forceps. The child weighed sixteen and a half pounds and was still-born, having evidently died during labor. Dr. Henderson felt that there would be doubt in the minds of many as to the authenticity of this case; still he felt impelled to narrate it. In the Transactions of the Medical Society of Pennsylvania for 1879 there is the report of a case by Dr. D. W. Jeffries in which the pregnancy lasted 358 days from the cessation of menstruation. Dr. Charles D. Meigs,[2] of Philadelphia, quotes at some length a case of *twin* pregnancy that lasted 13 months and 22 days, and he sums up thus: "Such is a compendious relation of the case, of which the particulars are given in long detail by Prof. Asdrubali. I lay it before the student with the assurance that I cordially accept the story of the accomplished author, and that, notwithstanding it presents a rare example of procrastination of the term, I find in it nothing impossible to believe." Another case occurred in Dr. Meigs' own practice, in which, according to the woman's statement, pregnancy had lasted 420 days; and, although Dr. Meigs does not vouch for the authenticity of the case, he evidently believes it to have been genuine. Schröder says: "I myself do not doubt for one moment that a mature child can be born within 240 to 320 days of the last period." Dr. Richard Wilson[3] reports a case of pregnancy lasting 371 days. The child (a male) weighed about six or seven pounds and was very active. "It seems possible," says Playfair,[4] "that in some cases of protracted pregnancy labor actually came on at the average time, but, on account of faulty position of the uterus or other obstructing cause, the pains were ineffective and ultimately died away, not returning for a considerable time." He reports the following case of prolonged gestation (or missed labor) occurring in his own practice: "The lady ceased to menstruate on March 16th, 1870. On December

[1] New York Medical Journal, May 11th, 1889. [1]
[2] Meigs, "Obstetrics: The Science and Art," 4th edition, 1863, p. 215.
[3] University Medical Magazine, July, 1890.
[4] Playfair, "System of Midwifery," p. 164.

12th—that is, on the 273d day—strong labor pains came on, the os dilated to the size of a florin, and the membranes became tense and prominent with each pain. After lasting all night they gradually died away, and did not recur again until January 12th, 304 days from the cessation of the last period. Here there was no assignable cause of obstruction, and the labor, when it did come, was natural and easy." Another well-marked case of prolongation of gestation is mentioned by Taylor.[1] This occurred in a healthy young woman aged 30 years. She had menstruated with regularity up to the third week in June, when the menses stopped without any apparent cause. Her delivery took place 323 days after the last appearance of the menses. The following case of missed labor (reported by a former pupil) is also quoted by Taylor: "A healthy woman, æt. 36, the wife of a farmer. The menses appeared for the last time in December, 1855, and she quickened in April, 1856. About the middle of September (*i.e.*, on the 283d day, dating from the last menstruation) Mr. Chattaway (her surgeon) was summoned to attend her, and he found her laboring under severe false pains. The case went on until the 19th November, 1856, when the patient was delivered of a female child of the average size. It would thus appear," says the author, "that gestation was prolonged in this instance to 330 days, or forty-seven weeks and one day." Mr. Duncan, of Shetland, has fully reported[2] an extremely interesting case of a woman who in her first pregnancy was not delivered until 300 days after the last menstrual period. The second and third pregnancies were of normal duration, but in the fourth, to which he particularly draws attention, she carried her child 325 clear days from the last menstruation. A case is reported by Dr. Power in his work on "Human Pregnancy," also quoted by Taylor,[3] in which gestation is said to have extended to 325 days.

Two cases of prolonged pregnancy are recorded in Leishman's work (page 177), one in which delivery took place on the 314th day, and the other on the 322d day. He admits, however, that both are open to doubt, and he explains them by the assumption that menstruation (from which the date of conception was calculated) may have been suppressed from some accidental cause five or six weeks before the women really conceived. Never-

[1] Taylor's "Medical Jurisprudence," p. 694.
[2] Ibid., p. 697. [3] Ibid., p. 695.

theless he does not specifically deny that these were genuine cases; he simply records the facts and leaves his readers to decide them according to their individual predilections. Still, while he neither affirms nor denies the possibility of such protraction, the whole tenor of his utterances conveys the impression that he believes that they *may* occur. Cazeaux and Tarnier[1] do not commit themselves, for they say: "While we have very strong and reliable evidence that pregnancy *may* be protracted to a period between 280 and 325 days, we have no *absolute* evidence that this is so." But Parvin[2] quotes Tarnier as stating "that it is impossible to admit an intra-uterine pregnancy passing the highest limits of normal pregnancy, unless some obstruction at the cervix prevents delivery." Dr. Robert Barnes takes the same view, and holds that a pregnancy lasting 300 days is highly improbable; and Dr. Fancourt Barnes said he had been engaged in the trial of a case of legitimacy in which it was agreed by all the medical witnesses that 280 days was the extreme limit of gestation.

On the other hand, we know positively that in the lower animals, notably in the cow and mare, where the date of insemination is definitely known, gestation does sometimes exceed the normal limits. M. Tessier and Lord Spencer have recorded some very interesting observations on this subject which are worth noting. Tessier, in a series of 577 cows where the date of covering was positively known, noted a difference between the shortest and longest gestations of 81 days; 20 went beyond full term, the longest protraction being 36 days. Of 447 mares observed by the same authority the variation was 129 days; 42 went beyond full term, 84 days being the longest period of protraction. Lord Spencer records the duration of pregnancy in 764 cows, 310 of which went beyond the average of 285 days by periods ranging from 1 to 28 days. Simpson, after detailing and commenting upon the investigations of these two observers, says: "Such direct experiments and observations on the lower animals afford evidence which necessarily, I think, forces us to admit that in exceptional cases in the cow (and hence also, as we certainly must freely infer, in the human female) the period of gestation may be prolonged 30 or 35 days beyond its normal

[1] Cazeaux and Tarnier, "Theory and Practice of Obstetrics," 8th edition, p. 1185.

[2] Parvin, "Science and Art of Obstetrics," 1886, p. 205.

and usual duration. And it is not improbable that further accurate and repeated experiments of the nature of those performed by Lord Spencer and M. Tessier may yet establish, by the same kind of proof, even a more extended limit to the *ultimum tempus pariendi*." As we are accustomed to reason by analogy from animals to man in other departments of medicine, why should we not do so in this case? Indeed, there are a few cases on record where pregnancy in the human female, the result of a single coitus, has gone several weeks beyond the usual term. That cases in which it has lasted 44 to 48 weeks from a single intercourse are rarely recorded cannot be taken as an argument against prolonged gestation, for reliable cases of single insemination are not sufficiently frequent in the records to form a criterion. There are, however, a few accounts which seem worthy of credence. Montgomery[1] mentions several cases where the date of insemination was definitely known, and where pregnancy was prolonged to 291, 285, 292, 284, 287, and 293 days. And Dewees, of Philadelphia, relates a case of pregnancy, the result of a specific cohabitation, in which the duration was ten calendar months, and says: "A case has occurred within a short time in this city in which the lady was not delivered for full ten months after her husband's departure for Europe, yet so well, and so justly too, did this lady stand in public estimation that there did not attach the slightest suspicion of a sinister cause." And the same authority says further:[2] "I have had every evidence, this side of absolute proof, that it has been prolonged to ten calendar months as an habitual arrangement in four females that I have attended." Prof. Retzius, of Stockholm, had a still more remarkable instance in his practice, in which this peculiarity, to a marked degree, was hereditary in a mother and two daughters. And Montgomery relates the case of a woman, whom he had attended, who had borne thirteen children and had exceeded her expected time with at least four or five children by from four to six weeks. "But," he says, "it must not be forgotten that in all these cases the calculations were based on the last appearance of the catamenia, and consequently do not afford perfectly conclusive grounds for an opinion. At the same time, when, very soon after menstruation, morning sickness and other indications of

[1] Montgomery, "Signs and Symptoms of Pregnancy," pp. 506–510.
[2] Ibid., p. 586.

pregnancy are experienced, and quickening takes place within four months, a combination of evidence is presented which should be considered as entitled to a high degree of consideration."

It is possible to explain some cases in which pregnancies have lasted from 1 to 4 weeks beyond the expected time of labor by the assumption that impregnation has occurred, not during or immediately after menstruation, but in the intermenstrual period or just before another epoch. But even admitting this, and deducting 23 to 25 days from the cases recorded, they would still be remarkable. Another source of fallacy in reckoning the duration of prolonged gestation is found in the possibility that the menses may have been suppressed from some unknown morbid cause for one or two months before conception really took place; but this argument is a two-edged sword, and, if it be accepted to account for cases of abnormal pregnancy, why would it not apply with equal force to cases which have apparently run the normal course, but in which the fetus is puny and delicate and is no larger than a child born at the seventh or eighth month? I confess that cases in which the beginning of pregnancy is based solely upon the suppression of the catamenia contain an element of doubt; but where, in addition to this evidence, there are morning sickness and other symptoms of conception, the diagnosis of pregnancy would seem to be justified. And if, moreover, the patient should be seen by a reliable and competent physician at such a period that the existence of pregnancy could be determined with reasonable certainty, and could be kept under observation during the whole period of her gestation, the elements of doubt would be removed, or at least reduced to a minimum.

The following case, which occurred in my practice within the past year, possesses these safeguards against error, and to my mind is an undoubted case of prolonged gestation: Mrs. E. B., æt. 25, the mother of two children, both born after normal pregnancies. Menstruation appeared March 31st, 1892 (about twenty months after the birth of her last child), and came on again for the last time on the 30th of April, the duration in each case being, as usual with her, seven days. Soon afterward she experienced morning sickness and other symptoms with which she was familiar through her previous pregnancies, which convinced her that she was again *enceinte*. About three months after the

menses stopped—or, to be more exact, on August 26th—she went to see Dr. James Morgan Barber, of this city, and intimated that she would like to get rid of the fetus. This, of course, Dr. Barber refused to do, but confirmed her in her belief that she had been pregnant about three months. Dr. Barber has since told me that he heard indirectly some time afterward that she was still talking of getting rid of the fetus. This statement the woman confirmed, though I believe she never took any active step toward producing an abortion. My informant also stated that he had known Mrs. B. a number of years, and believed her statements to be entitled to the fullest belief. Fetal movements were first noticed about the middle of November, six and a half months after she ceased to menstruate, and about the middle of the assumed term of pregnancy. Her gestation was devoid of incident of any kind, except that for the final three months she suffered from an indefinite sense of oppression or "smothering." Her health has always been excellent; she has had no miscarriages and no disease nor displacement of the uterus, so far as I could learn. On May 28th, 1893, her husband came to my office and said that his wife had gone over her time, and asked me to see her. Upon questioning the woman and finding, according to her statement, that her pregnancy had lasted over a year, I was naturally incredulous, the one thing that gave color to her story being her accuracy as to dates. No amount of cross-questioning on my part was able to shake her positive assertion that she had ceased to menstruate on the 6th of May and that she had visited Dr. Barber's office on August 26th. Dr. Barber was able to corroborate this latter statement by a reference to his books. Upon examination I found the abdomen enormously distended, and by palpation the fetus was found presenting by the vertex. The os was soft and patulous, but was not dilated, and at that time she had no symptoms of impending labor. I prescribed ten grains of quinine once a day, and told her to send for me again the next day if labor had not commenced, when I would make another effort to bring it on. Early on the morning of the 30th I was again summoned, and found that she had been in labor since about noon of the preceding day. The cervix was dilated to the size of a quarter and the pains were regular and active. I ordered another dose of quinine (ten grains), and, having assured her that the child was in a good position and that the labor

would be natural, I left her. I made several other visits between that time and noon, when she was delivered of a female child, well formed and active, which weighed nine pounds. The placenta was detached in the last paroxysm and came away at the birth of the child, together with a large quantity of liquor amnii. Her convalescence was rapid and uneventful.

The case may be summed up thus: Her last menstruation was on the 6th of May, 1892, and she was delivered on the 30th of May, 1893—an interval having elapsed of 389 days, or 55 weeks and 4 days, 13 calendar months lacking 1 week. Even admitting that fructification did not take place immediately subsequent to her last menstruation, but just before the next expected epoch—that is, on the 30th of May—and deducting 23 days on account of this error, even then pregnancy must have lasted 366 days, or 1 year and 1 day. A greater allowance for error than this could hardly be asked; for, from the standpoint of a believer in the possibility of protracted gestation, her visit to Dr. Barber could scarcely have been better timed. Occurring, as it did, at the earliest period at which the existence of pregnancy could be diagnosed with reasonable certainty, yet so late that she could not have conceived afterward and produced a mature child, this visit is the keystone to the whole structure, and without it the whole case would have collapsed into a mass of assumptions based only on a foundation of the woman's unsupported testimony.

There is one point in this case which may cause a doubt to arise in the minds of many as to the genuineness of the prolongation, and that is the late date at which quickening was first perceived—six and a half months after the alleged date of conception. Nevertheless I have found many similar cases in the records, and Montgomery says, speaking of this very subject: "I may, however, just observe that in several of the cases in which gestation was supposed to be protracted much beyond the ordinary limits, it had also been remarked that quickening had taken place at some unusually late period, as at six or seven months." And the same author says in another place: "Some, on the other hand, do not quicken until much later periods of gestation. The writer was in the habit of attending a lady who, in seven successive pregnancies, felt the child for the first time in the sixth month and once in the seventh." Baudelocque also mentions the fact that some of his patients did not quicken until



after the sixth or seventh month, and says: "In one of these women, whatever we could do, and notwithstanding the very obvious ballottement of the child *in utero* which we could perform by the finger introduced into the vagina, its motions could not be ascertained, either by the mother or by the accoucheur who examined her, till the end of the seventh month."

It would be unprofitable to enter here upon a discussion of the cause of prolonged gestation, for until the profession agrees as to why labor commences at the ninth month it seems hardly likely to agree as to the reasons why it may *not* come on at that time. If, however, the hypothesis of Barnes be accepted, that it is due to some influence inherent in the fetus, it seems possible that labor is exceptionally postponed for one or two months because, by reason of slow growth or temporary cessation of growth, the fetus is not fitted for independent existence. Duncan,[1] speaking of this subject, says: "Unless it be supposed that pregnancy is protracted for the special behoof of small and ill-developed children, it must be admitted that an extraordinary development of the fetus is to be looked for in such cases." And Wilson says: "Others have connected it with tardy development of the fetus, with the influence of depressing emotions, etc." Meigs[2] is a little more ambiguous, for he explains it by the supposition that "the womb of one individual, as well as the fetus within it, may be ready for the act of parturition earlier or later, according to the force of a variety of causes to the operation of which they are subject."

In conclusion, I wish to direct attention to the apparent effect of quinine in inducing labor in this case. At my first visit there was no indication whatever that labor was about to begin, but after two doses of quinine of ten grains each severe pains commenced, and increased in frequency and strength after the third dose. Whether this result is to be considered *post hoc* or *propter hoc* I am not prepared to say, but in the absence of conclusive proof I am inclined to give the drug the benefit of the doubt.

CORNER 1ST AND B STREETS, N. E.

[1] Duncan, "Fecundity, Fertility, and Sterility," Edinburgh, 1866.

[2] Meigs, "Obstetrics: The Science and Art," p. 217.

CONSERVATIVE SURGERY OF THE UTERINE APPENDAGES.

BY

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By conservative surgery of the uterine appendages I mean such surgical operations as have for their purpose the preservation of the healthy functional life of these organs. And this conservative work must be radical, for the surgeon must strike at the very root of the disease, and remove not only the products of inflammation but the original source of infection, if he looks for permanent good results.

Too great praise can never be given to those pioneers in abdominal surgery who have taught us how simple and how safe a thing it is to enter the peritoneal cavity when this is done under the proper conditions and surroundings. Nor can too much credit be given them for the thousands of lives that have been saved through their teachings. They preserved the lives of numbers of women and restored them to comparative health and happiness, securing results that were at that time satisfactory to both patient and surgeon, and, when compared with the old methods of the non-operative gynecologists, were brilliant indeed.

But the extirpation of inflamed and diseased uterine appendages, while it relieved the woman of the misery and suffering by which she had been invalided possibly for years, took away from her ovulation and menstruation—functions so dear to her, and I believe so necessary, during that period of life to which they belong, to the complete physical and mental welfare of every woman.

My attention was called by Dr. Polk, when I first began to assist him in the winter of 1886, to a plan of treatment by which the inflammatory diseases of these organs could be cured and yet these functions might be preserved to the woman. He had then begun to put into practice a method of operative treatment of diseased and adherent tubes and ovaries which, with slight modifications and extensions, is the same as that

which he has but recently described in a paper read before the American Gynecological Society in May, 1893, and published in the New York *Journal of Obstetrics and Gynecology* for August, 1893.

He first called the attention of the profession in general to his views on this subject in a discussion, in the New York Obstetrical Society, of a paper read by Dr. C. C. Lee in March, 1887. He then said that he was satisfied that every day, under the name of "cellulitis," catarrhal salpingitis was cured by routine means. Why, then, should we deny the tubes the chance of cure that lay in freeing them from adhesions, cleansing them, and opening up their fimbriated ends? He thought that the time had come for us to aim at something better than the mere extirpation of these organs. In answer to a question put by the president of the Society as to whether he believed that a catarrhal salpingitis, where the tube was the size of a finger, could be cured by simply breaking up the adhesions and washing out the tube, Dr. Polk stated that such was his exact position.[1] This announcement of his position in this most important question was followed in a few weeks (April 19th, 1887) by a paper entitled "Laparatomy for Adherent Retroflexed or Retroverted Uterus," in which paper he recited four cases where the inflamed and adherent appendages were freed from their adhesions, the fimbriated extremity of the tube opened, the tubes washed out and with the ovaries returned to the abdominal cavity, and in which a cure of all symptoms and a disappearance of all physical signs were secured. Again, in September of the same year, he reported four more cases in a paper read before the American Gynecological Society, at which meeting were present a large number of representative medical men of this and foreign coun-

[1] In this connection a paper read in May, 1885, before the American Medical Association by Dr. B. E. Hadra, of San Antonio, Tex., entitled "Intraperitoneal Adhesions in relation to Tait's Operation," is of great interest. While the principal purpose of his paper was to deal with general peritoneal adhesions, especially those above the plane of the pelvis between the omentum and parietal and visceral peritoneum, he also advocated the liberation of adherent appendages and their return to the pelvis when these organs were healthy or but slightly changed. This principle of conservative surgery he did not, however, extend to inflamed and diseased appendages, as is shown by his concluding sentence: "My object is not to disparage Tait's operation, but in doubtful cases, *when we find the ovaries and tubes healthy*, let the unfortunate woman have the benefit of the doubt and let the operation conform to the conditions that are revealed by it."

tries who had but recently been in attendance at the International Medical Congress at Washington—a fact that seems to have been overlooked by some of the foreign guests then present who engaged in criticism of the proposed innovation in abdominal surgery, judging by a recent paper from one of them which appears in the Transactions of the American Gynecological Society for this year. In later papers Dr. Polk has described the method as it stands to-day, and as it will, I believe, soon be accepted by all workers in this field.

I have gone into the history of this method of procedure very carefully, because it cannot fail to prove interesting reading to all those who are familiar with the recent literature, especially foreign, of this subject. The discussions provoked by Dr. Polk's early papers on this subject were in opposition to any surgical treatment short of extirpation. Those who spoke on the subject in the New York Obstetrical Society and elsewhere were willing to accept but two lines of treatment: absolute noninterference or extirpation. I believe it the duty of all of us who have seen the good results of treatment of inflammations of the uterine appendages according to this method to report our experience, that others may profit by it if there is good in it, or show us our fault if in our enthusiasm we may have fallen into error. I therefore ask no apology for this paper.

We are all now, I take it, ready to admit that tubal and ovarian inflammations have their origin, as a rule, in some inflammatory condition of the uterus or its lining membrane, and that the disease of the appendages and their surrounding and neighboring peritoneum is but an extension of the original pathological condition of the uterus. Dr. Polk, recognizing this fact, and realizing that, no matter what method of treatment might be pursued in dealing with the inflamed appendages, the original source of infection must be removed, advises, in all these cases of tubal disease, the thorough curetting of the uterus and firm packing of its cavity with gauze according to the method detailed by him in a paper read before the New York Academy of Medicine in December, 1891, and published in the New York *Journal of Obstetrics and Gynecology* for February, 1892. Indeed, as he has shown in this paper, not a few cases of salpingitis may be cured by this plan alone.

In all of my cases of tubal disease demanding operation, the uterus has been curetted and packed with gauze either before

or at the time of the celiotomy. In the majority of cases this has been done when the celiotomy was made, as it may almost always be easily accomplished by a surgeon who works expeditiously. I have on more than one occasion curetted and packed the uterus, repaired lacerations of cervix and perineum, and resected[1] the tubes or ovaries at the same sitting, all within an hour, thus avoiding a second etherization of my patient.

The Trendelenburg posture has simplified all abdominal work enormously. We can bring our field of operation into view, and by the proper placing of flat sponges (or sterilized gauze pads, if one prefers them) we can shut off the general peritoneal cavity from any possible infection at the time of operation. Flooding the cavity is no longer necessary, and drainage tubes can be dispensed with entirely, two common avenues for the introduction of sepsis being thus closed. This great advancement in the technique of abdominal surgery—for which we are indebted to Dr. Florian Krug—renders conservative operations on the uterine appendages very much simpler in their performance, and very much less liable to be followed by the reformation of adhesions, than was the case before this posture was in vogue.

Dr. Polk tells us that conservative surgery may come into play in dealing with simple salpingitis and its accompaniments, smaller ovarian cysts in which some of the organ remains intact, hydrosalpinx, and hematosalpinx.[2] He has laid down such clear and accurate rules for the treatment of these cases that nothing further need be said about them. But I would not draw the line where he has drawn it, because I believe that certain cases of pyosalpinx may be successfully treated by amputation of the tube at some distance from the cornu of the uterus[3]

[1] By resection or amputation of the tubes I mean the cutting-off of the diseased abdominal end of the tube, not the removal of a portion of the wall of the tube. In this resection or amputation—and the words may be regarded as interchangeable here—the apparent healthy portion of the tube is returned to the pelvic cavity as described.

[2] Two cases of conception have already been reported as following amputation of the tubes, one in the practice of Dr. Polk and one by Dr. McMonagle, of San Francisco; Dr. Polk's case being amputation of both tubes and one ovary. In another instance (Case 2, p. 184, vol. xviii., American Gynecological Society Transactions), after removal of both appendages on one side and exsection of two-thirds of the remaining ovary, conception occurred, and delivery took place ten months after the operation.

[3] For Polk's rule for dealing with pyosalpinx, see vol. xviii., p. 182, Transactions of the American Gynecological Society. He amputates the purulent end of the tube, the same as in hydrosalpinx and hematosalpinx.

the purulent inflammation, in its extension from the uterus, reaches the tubes, they become heavy, fall lower in the pelvis, and the infundibulum becomes closed, as a rule, by adhesion to some neighboring structure—viz., the ovary, the uterus, the intestine, or, most commonly, the pelvic floor. Drainage is thus abolished and pus accumulates in and distends the abdominal end of the tube. But in some cases there is a portion of the tube, from half an inch to an inch or more in length outward from the uterine cornu, which is not increased in size, and the mucous, muscular, and serous coats of which are apparently scarcely, if at all, inflamed. If these tubes are examined closely it will be found that this healthy portion of the tube is shut off from that portion which is distended with pus by a closure of the lumen of the tube on the outer side of the uninflamed part, and that the uterine ostium of the tube is patulous. Thus it is easy to see why this portion of the tube has not become involved in the general destructive purulent process. It has simply drained itself into the uterine cavity, and, the pus in its outer end being encysted, this portion of the tube next to the uterus has been restored to its normal condition.

In such cases of pyosalpinx where the ovary is healthy and the fimbriated end of the pus tube is not adherent to it, I have amputated the tube at the outer end of the healthy portion, washed it out, slit it up a short distance, and united its serous and mucous coats by fine catgut sutures, thus forming an artificial ostium abdominale. The tying of the mesosalpinx in the resection of the tube has been done in such a manner as to bring the new open end of the tube close to, but not in contact with, the ovary. The uterus has then been curetted and its cavity packed with gauze. These cases have done perfectly well, all symptoms being relieved and all physical signs disappearing, their menstruation has been regular and painless, and the possibility of conception has been restored to them.

Recently a patient came to me, for the cure of ventral hernia, upon whom I had operated a year ago, removing at that time a purulent tube and ovary from her right side and breaking up adhesions about the left tube and ovary, opening the closed end of the tube, and resecting the cystic ovary, about one-third of the organ being removed. On opening the abdomen the second time I found the tube and ovary I had left the year before, in



Name.	Age.	Symptoms.	Diagnosis.	Date of operation.	Treatment.	Discharged.	Remarks.
E. A..	26	Abdominal pain; lumbar pain; dysmenorrhea.	Retroflexed, adherent uterus; adherent appendages.	June 27, 1891.	Adhesions broken up; hysterorrhaphy.	July 25, 1891.	Patient went out in good physical condition; reported some months later free from pain, menstruation normal.
N. H.	29	Pain in both groins and lumbar region; dysmenorrhea.	Retroflexed, adherent uterus; adherent appendages.	July 20, 1891.	Adhesions broken up; hysterorrhaphy.	Aug. 15, 1891.	Patient seen August, 1893; has been entirely well since operation.
C. L..	20	Pain in both groins; dysmenorrhea; profuse menstruation.	Salpingitis; enlarged cystic ovaries.	August 18, 1892.	Resection of both ovaries; amputation left tube.	Sept. 28, 1892.	Patient was discharged well; reported one month later that she was well and menstruating normally.
M. D..	27	Lumbar and sacral pain; profuse leucorrheal discharge; dysmenorrhea.	Salpingitis; adherent tubes and ovaries.	Sept. 10, 1892.	Adhesions broken up; amputation left tube; resection of left ovary.	Oct. 18, 1892.	Patient left hospital free from pain and in good condition.
B. M.	26	Lumbar and sacral pain; menorrhagia; dysmenorrhea.	Adherent tubes and ovaries; right pyosalpinx and abscess of ovary; left ovary cystic; tube occluded.	Sept. 18, 1892.	Removal right tube and ovary; resection left ovary; breaking up adhesions; opening occluded tube.	Oct. 15, 1892.	Well, except for central hernia in August, 1893; herniotomy, August, 1893; tube and ovary found perfectly normal.
B. V..	26	Suprapubic and lumbar pain; dysmenorrhea; menorrhagia; leucorrhea, profuse.	Adherent appendages; cystic ovaries; salpingitis.	Nov. 14, 1892.	Adhesions broken up; occluded tubes opened; ovaries resected.	Dec. 8, 1892.	Patient left hospital in excellent condition; reported herself well one month later.
W. S.	19	Pain in both groins; dysmenorrhea; leucorrhea.	Adherent appendages; cystic left ovary; right pyosalpinx.	June 25, 1893.	Adhesions broken up; resection of left ovary; amputation right tube.	July 28, 1893.	Patient in excellent condition at present time, Sept 25th; menstruation normal; no physical signs.
L. C..	40	Lumbar and sacral pain; severe headaches; dysmenorrhea.	Adherent appendages; cystic ovaries.	July 31, 1893.	Adhesions broken up; ovaries resected	Aug. 28, 1893.	Patient reports herself well on Sept. 20th; has been in better health since operation than for ten years before.
B. B..	27	Lumbar and sacral pain; dysmenorrhea.	Adherent appendages; left pyosalpinx; small ovarian cyst on right side.	July 25, 1893.	Amputation of left tube; enucleation of cyst; resection of ovary.	Aug. 30, 1893.	Discharged cured; reported herself well on September 20th.
M. F..	19	Severe pain in sacral region; dysuria and pain on defecation.	Double pyosalpinx.	July 25, 1893.	Amputation of both tubes.	Aug. 21, 1893.	Discharged cured; no symptoms or physical signs.
A. B..	40	Lumbar and sacral pain; irregular menstruation.	Adherent appendages; double pyosalpinx.	July 18, 1893.	Adhesions broken up; both tubes amputated.	Aug. 14, 1893.	Patient left hospital in very good condition.
M. M.	21	Severe suprapubic and right iliac pain.	Adherent appendages; salpingitis.	June 19, 1893.	Adhesions broken up; right tube amputated.	July 19, 1893.	Discharged well; has since reported herself in good condition.
L. S..	23	Pain in right groin; irregular menstruation.	Salpingitis; cystic ovaries; adherent appendages.	July 5, 1893.	Adhesions broken; both ovaries resected.	July 27, 1893.	Discharged in good condition; reported herself well one month later.
S. G.	20	Suprapubic and lumbar pain, dysmenorrhea.	Salpingitis; adherent appendages; cystic ovaries.	Aug. 8, 1893.	Adhesions broken up; ends of tubes opened; ovaries resected.	Sept. 8, 1893.	Patient left hospital well, and has been perfectly well since.
M. M	34	Severe dysmenorrhea; pain in groins.	Adherent retroverted uterus; adherent appendages; small ovarian cyst.	Sept. 19, 1893.	Breaking up adhesions; hysterorrhaphy; enucleation of cyst; resection of ovary.	Still in hospital.	Is convalescing satisfactorily.
C. M..	27	Lumbar and sacral pain; dysmenorrhea.	Salpingitis; adherent appendages; cystic ovaries.	Aug. 29, 1893.	Breaking up adhesions; resection of ovaries.	Still in hospital.	Convalescing satisfactorily.
A. M.	30	Dysmenorrhea; lumbar and sacral pain.	Salpingitis; adherent appendages.	July 28, 1891.	Breaking up adhesions; amputation of right tube.	Aug. 28, 1893.	Has been well since discharge; menstruation regular and painless.
M. V..	26	Dysmenorrhea; frontal headaches; intercostal, lumbar, and sacral pain.	Ovarian cyst; cystic ovary; adherent appendages.	July 29, 1893.	Ovariotomy; resection of ovary; breaking up adhesions.	Aug. 30, 1893.	Patient in excellent condition, well and free from pain.

appearances perfectly healthy. The fimbriated extremity of the tube was open, and there were no evidences of the resection of the ovary to be found. The woman had been entirely well for a year, except for the annoyance of her hernia, and had menstruated regularly and painlessly during that time.

In closing this paper I wish to call attention to the appended table of eighteen cases. Five were cases of pyosalpinx which admitted of amputation of the tube and the formation of a new ostium abdominale. These cases made equally as good recoveries as those of simple catarrhal salpingitis, and their subsequent history shows that in these five cases, certainly, the operation was a decided success. None of the patients subjected to this procedure have died, and in no single instance has the operation failed to bring relief. The eighteen patients, it will be seen, are young women, all but three being under 30 years, and the mean age being 25 years, giving an average of about twenty years more of menstrual life which should be passed painlessly, with a possibility of conception for any one of them.

In addition to the histories contained in the table, I desire to call attention to the following detailed account of a case of pyosalpinx treated by resection of the tubes. May F., aged 19, was admitted to Ward 23, Bellevue Hospital, July 7th, 1893, suffering from a profuse vaginal discharge. Examination revealed the presence of gonorrhea with endometritis and slight salpingitis. She was put on local treatment, bichloride of mercury douches, and applications to the vaginal mucous membrane, and at the end of ten days the uterus was curetted and its cavity packed with gauze. On July 25th the abdomen was opened, the patient being in the Trendelenburg posture. The tubes and ovaries were found bound down by extensive adhesions, the tubes being adherent to the pelvic floor. The field of operation having been isolated by flat sponges, the tubes were freed and pus was seen escaping from their fimbriated extremities. The tubes for at least an inch from the uterine cornua were normal in appearance, and were therefore amputated at this point. They were slit up, washed out, and the mucous and serous surfaces united with fine catgut sutures. The pelvic cavity was sponged dry and the abdominal wound closed without drainage. The patient made an uneventful recovery, and has remained well since, menstruating regularly and painlessly.

A CASE OF DIFFUSE SARCOMA OF THE MUCOUS MEMBRANE OF THE UTERUS.[1]

BY

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(With three illustrations.)

About a year ago Dr. James H. McIntosh, of Newberry, S. C., sent me a portion of a growth, removed from the uterus by curetting, for examination. I pronounced it sarcoma, and shortly afterward he performed a vaginal hysterectomy. The uterus was put into alcohol and forwarded to me. On making a vertical section through it the cavity is found to be almost completely filled with a soft, succulent mass of a light pink color, closely adherent to the wall all around, but apparently not invading it. As the quantity of the new growth originally sent on for diagnosis was large, the cavity must have been completely filled at the time of the curetting. The external os is patulous, measuring 2.5 centimetres in its lateral and 1.2 centimetres in its antero-posterior diameter. The measurements of the uterus are as follows: Vertical diameter, 12.7 centimetres; depth of cavity, 9.6 centimetres; circumference just below level of Fallopian tubes, 20.5 centimetres; circumference at level of internal os, 14.7 centimetres; thickness of wall at fundus, 1.2 centimetres; thickness of wall midway down, 8 millimetres; thickness of wall just above internal os, 6 millimetres.

The Fallopian tubes are not enlarged, and on gross examination appear to be normal.

Microscopic Examination.—I examined portions of the neoplasm, the cervix and part of the vagina, the wall of the body, the fundus, and the Fallopian tubes.

The tumor is found to be composed of large round and spindle cells. Giant cells are scattered here and there throughout the mass. No stroma could be demonstrated, the cells being held

[1] A report from the Pathological Society, October 11th, 1893.

together by cement substance. In certain parts of the tumor large blood vessels are so numerous as to suggest an angio-sarcoma. Small blood vessels and capillaries are plentiful and traverse the tumor in all directions.

The cervix is normal except for such senile changes as would be expected in a woman the age of the patient. The epithelial covering is intact. The vagina is healthy.

The wall of the body shows the same changes found in the cervix, but the mucous membrane is wanting. The sarcomatous tissue runs down to the muscle and stops there abruptly. Along



FIG. 1.—Uterus, showing neoplasm nearly filling the cavity.[1]

the line of junction an occasional giant cell is seen, and there is a slight round-cell infiltration of the muscular tissue at different points.

At the fundus there is also an absence of mucous membrane, and the new growth dips down into the muscular tissue of the wall, but does not actually invade it. The whole process is confined to the mucous membrane, as was anticipated at the gross examination from the ease with which the neoplasm separated from the uterine wall. Numerous thin-walled blood vessels are seen to pass from the uterus into the tumor at this point.

Fallopian Tubes.—Close to the uterus both tubes are in-

[1] The drawing was made by Dr. J. M. Byron.

volved, but in a peculiar way. In several of the reported cases the extension of the disease process from the body of the uterus to the tubes was in the form of a plug, which in one case projected out at the fimbriated extremity.[1] But here the sarcomatous tissue is found creeping along under the mucous membrane and dislodging it. It is surprising, however, in view of the extent of the growth in the uterus itself, to what a short distance it has gone. In neither tube has it advanced more than eight to twelve millimetres. One of the tubes—I forgot to

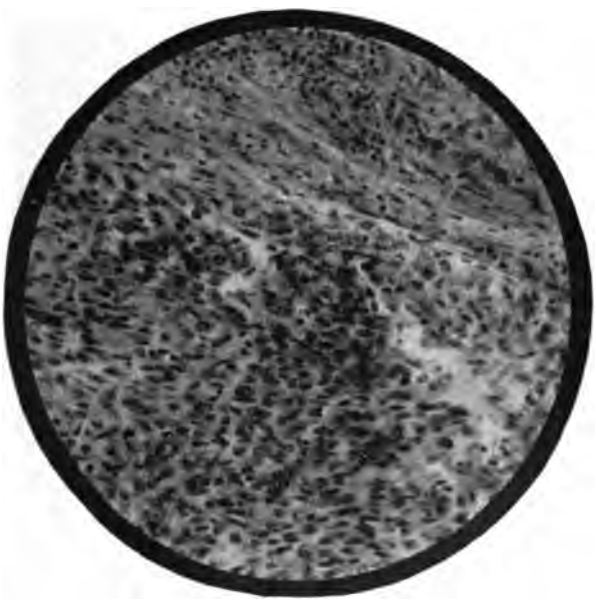


FIG. 2.—Section through fundus, showing neoplasm and uterine wall. Objective, Spencer & Smith ¼ inch homogeneous immersion N. A. 1.35. Projection ocular No. 2. 210 diameters.[2]

record whether the right or left—presents a thrombus composed of sarcomatous elements in a little vessel of its wall.

History.—The case occurred in the practice of Dr. B. W. Taylor, of Columbia, S. C. The patient was 67 years old, of American parentage, and had had seven children. Menstruation ceased at 55, and the menopause passed without any unpleasant symptoms. A bloody discharge from the uterus commenced about one and a half years before the time of the operation. She was curetted twice with temporary relief. The operation

[1] Simpson, "Contributions to Obstetrics and Gynecology," Sarcoma, Case 2.

[2] The photomicrographs were made by Dr. H. S. Stearns.

was performed October 24th, 1892. Shortly after the operation abdominal pains set in, and two weeks before her death the bloody discharge returned. On January 26th, 1893, she became paralyzed on the left side, and passed into a comatose state which gradually deepened until she died, three days later. No autopsy was obtained, but an examination before death revealed a tumor occupying the right iliac region measuring ten by five centimetres, and another below the umbilicus measuring fifteen by seven centimetres. The vaginal roof was filled with a soft

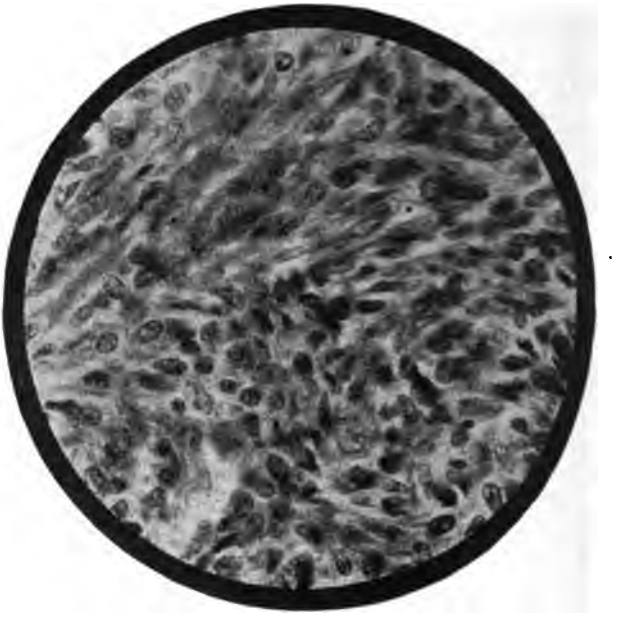


FIG. 3.—Neoplasm. Objective, Leitz 1-12 homogeneous immersion N. A. 1.30. Zeiss projection ocular No. 2. 600 diameters.

growth easily breaking down and bleeding freely on manipulation.

According to M. Terrillon, uterine sarcomata, from a pathologic point of view, present themselves in three varieties: 1. Sarcoma of the mucous membrane. 2. Interstitial sarcoma. 3. Cystic sarcoma.

The interstitial occurs in two forms, the circumscribed which is often pediculated, and what he terms the *gigantesque*, where there is an enormous hypertrophy of the uterus. In the cystic

form the cysts have thick walls and often contain bloody liquid.[1] I can find no statement as to the relative frequency of the different varieties.

Sarcoma of the uterus is so commonly stated to be a rare disease that I undertook to look up the literature of the subject. Many writers say that less than one hundred cases have been recorded. But as early as 1870 Gusserow had collected sixty-two cases, and in 1874 A. R. Simpson added four to the list. I have found forty-five cases reported during the last five years diagnosticated microscopically as sarcomata, and a considerable number in the same period under such headings as "soft fibroid," "fibro-cysts," and "recurrent fibro-cystic tumors of the uterus," which, as the history clearly shows, should be classed with the interstitial or cystic sarcomata of Terrillon. I shall cite one or two such instances. The author says: "The tumor was a fibro-cyst and contained large cystic cavities. It presented rather an edematous, spongy condition. . . . The hemorrhage was alarming on account of the extremely vascular nature of the tumor." The uterus had enlarged in eight months to its size at full term. No microscopic examination was made. In another case the tumor rose as high as the umbilicus, and had grown to this enormous size in six months. Here the tumor is said to be fibro-cellular and not wholly fibrous, but the author records it under the title of a "fibro-cyst" without waiting for a microscopic examination. These and hysterectomies for an "interesting pathological condition" or "malignant disease of the uterus" are the headings that one encounters in reviewing the subject.

When we take into account, also, the recurrent fibroids and fibro-plastic tumors of the earlier writers, and the fasciculated cancers of Rokitansky, the number of sarcomata of the uterus will be materially increased and we shall find it not such a rare pathologic condition. Thomas[2] says "that many cases have been regarded as cancer, and not a few of supposed fatal fibroid or polypus have been unquestionably of this affection."

[1] Gaz. de Hôp. Paris, 1890, lxiii., 1269.

[2] "Thomas on the Diseases of Women," 4th edition, p. 539.

POLIOMYELITIS ANTERIOR ACUTA INFANTILIS:

ITS ETIOLOGY AND TREATMENT. A CLINICAL STUDY OF SEVENTY-FIVE CASES.[1]

BY

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During the past fifty years, since Von Heine, as the result of his observations, gave to the medical world the first well-defined clinical picture of "infantile spinal paralysis," so much has been written, and has been so ably and comprehensively written, on the pathology, etiology, symptoms, course, and treatment of this disease, that it seems little less than presumptuous for any one to take up the pen laid down by Seeligmüller, Jacobi, Ross, and Gowers. But its etiology is not so well understood as to cause any diminution in the frequency with which the disease occurs, nor has the treatment been so successful that a radical cure is, as a rule, expected. I would therefore crave your indulgence for the triteness of the subject, and ask your attention for a short time to the consideration of a composite picture of seventy-five cases of poliomyelitis anterior acuta infantilis.

Etiology.—The causes are divided into predisposing and exciting. I have found as possible predisposing causes sex, age, season of the year, race, condition of health, heredity, and tuberculosis or the tubercular diathesis; as exciting causes are the psychical, the exanthemata, acute febrile diseases, exposure to cold, over-exertion, traumatism, dentition, and infection. For various reasons this order will not be strictly followed.

Sex.—Of the 75 cases 47 occurred in boys and 28 in girls—*i.e.*, in the proportion of about 5 : 3. This accords with the view of the older rather than the more recent authorities, and would indicate a greater predisposition of the male sex even before 10 years, and after this age Gowers says that the malady is practically confined to it.

[1] Read before the Orthopedic Section of the New York Academy of Medicine, December 16th, 1892.

Age.—

TABLE SHOWING THE AGE OF ATTACK IN SEVENTY-FIVE CASES.

Age.	No. of cases.	Age.	No. of cases.
Congenital	1	16 months	9
5 months	1	18 "	5
6 "	1	20 "	2
7 "	2	21 "	1
8 "	1	2 years	10
9 "	1	26 months	1
10 "	2	27 "	2
11 "	4	2½ years	6
1 year	4	3 "	6
13 months	6	3½ "	2
14 "	1	4 "	2
15 "	4	5 "	1

Average age, 20 months and 3 weeks.

The one case I have recorded as congenital was that of a girl taken to the Foundling Asylum when 4 weeks old, and first brought to me at 9 years of age. This throws no light on the mooted question of an intra-uterine spinal paralysis, which is believed by Sinkler and Morton frequently to be the cause of congenital clubfoot.

The disease is rare during the first six months of life. The earliest age recorded is by Duchenne, in which the attack occurred on the twelfth day, also one at 4 weeks. Sinkler records one case at 6 weeks and two cases at 3 months; Seeligmüller three cases at 10 weeks. The youngest case given by Gowers is 4 months, while the youngest on my own list is 5 months. The oldest was 5 years. Of the 75 cases, 70 occurred during the first three years of life, and of these 38, or one-half the entire number, during the second year. The average age—20 months and 3 weeks—is considerably below Sinkler's average, which, in a list of 244 cases, was 2 years, 1 month, 2.21 days. Notwithstanding this discrepancy, of the 247 cases which occurred under 3 years, 134, or considerably more than one-half, of Sinkler's cases occurred during the second year. Thus we learn that while the disease is most frequent during the first three years of life, it is extremely rare before the tenth month, and the period of greatest susceptibility is between the eleventh month and the end of the second year.

Over-exertion, first pointed out by Lange and afterward advocated by Seeligmüller as one of the predisposing causes, is too important a factor to have so little stress laid upon it as has

heretofore been the case among American writers. The clinical evidences in support of this view are:

1. The age of the most frequent occurrence of poliomyelitis anterior in children corresponds to the age at which they are beginning to walk. 2. The preponderating frequency of a lumbar rather than a lesion of the cervical ganglia. Of these 75 cases there was in every instance a lower extremity involved in the initial paralysis; in 66 per cent both lower extremities; in only 13 per cent the upper extremities, only 3 of which remained permanently paralyzed. 3. That the attacks often follow an unusually long walk, while in other cases the child showed an indisposition to walk for one or two weeks previous to the attack.

It is interesting to note in this connection that the case in which the attack occurred at 6 months ("January; cause, dentition") the child was beginning to stand by a chair—an unusually early age. After the attack she did not again sit up until 1 year old.

Of the 43 in which a note was made of the age at which they began to walk, 4 had never walked before the attack, 15 had been walking for some considerable length of time; of the remaining 24, or more than one-half, 4 had been walking between three and four months, and 20 were just beginning to walk—*i.e.*, one month or less.

The cause of the vastly greater susceptibility of the lumbar region is partly anatomical, partly functional. Angel Money has pointed out that the lower part of the cord receives its blood supply at a great disadvantage. The arteries, after their entrance into the intervertebral foramina, having to ascend a considerable distance before reaching the cord, this, combined with the small calibre of the vessels, offers much resistance to the onward flow of the blood; and since the maximum force of the circulation is on the periphery, the nutritive supply of the centre is easily cut off. Beginning locomotion, readily carried to over-exertion, may cause an exhaustion of these motor ganglionic cells and thereby the tendency of the same to inflammatory disease. The lower part of the cord, physiologically late in developing, by this new functional excitation has, particularly in the anterior horns of the lumbar enlargement, a rapid increase in its blood supply. Hence the increased liability to congestion.

Dentition.—In 27 cases—over 33 per cent—the attack occurred during the eruption of the teeth. The mistake has been made of considering dentition as a predisposing rather than an exciting cause. A more careful study of these cases will show, I think, that dentition is not only delayed and therefore apt to be difficult, but also that it is exceedingly rapid.

In only 9 cases was any note made as to whether the attack occurred during the eruption of the first teeth. In 6 cases it was—viz., 2 cases at 7 months, 1 at 10 months, 1 at 13 months, 1 at 16 months, and 1 at 18 months. In the case which occurred at 26 months dentition had been normal as to the time of eruption, and the child walked at 1 year. In the case at 2 years 4 molars came through together. In the case at 4 years, the child had begun to stand at 7 months and walked well at 1 year; at the time of the attack "13 teeth just seemed to come through together." This same statement was made in regard to the child of 16 months: "And then all the teeth seemed to come through together."

"This late dentition would indicate a lack of lime salts in the system. Hence the sudden diversion of the lime salts to the teeth would cause a drain on the already impoverished blood, thus robbing the tissues, especially the nervous system, and so increase its liability to disease" (M. Putnam Jacobi).

But the theory seems more probable that only in those cases where the nervous system is predisposed to poliomyelitis anterior does this rapid dentition act as the exciting cause. The physiological pauses which give the system an opportunity to recover itself and prepare for the next strain are entirely absent. It acts then as the explosive applied to the surcharged nervous system.

Season of the Year.—Of the 47 cases in which a note was made of the season of the year, 14 occurred in August, 10 in July, 9 in September; October, December, and March, each 3; January, 2; November, February, and June, each 1 case—*i.e.*, 70 per cent occurred during the months of July, August, and September. This is in accord with the now generally accepted belief of the predisposing influence of the hot weather on the development of the disease, first pointed out by Sinkler.

Race.—I find no suggestion as to the possible relation of race or climate upon the production of the disease. New York being such a cosmopolitan city, the statistics on this subject may

which note was made, 19 were Germans, 10 Americans, 7 Irish, 2 English, 2 Swedes, 2 Swiss, 2 Negroes, 2 Austrians, 2 Polish Jews, 1 French, 1 Scotch. Of the mixed races—*i.e.*, where the father and the mother belonged to different nationalities—4 were Irish-Americans, 3 Irish-English, 1 Irish-Canadian, 1 Danish-American, 1 English-American, 1 German-American, 1 German-Austrian, 1 Scotch-Nova-Scotian, 1 Franco-German. Thus, while no race would seem to be exempt, it was much more frequent among the Germans than among any other race, Germans constituting about 33 per cent, Americans about 14 per cent, Irish about 10 per cent. Of the 19 children of German parentage, 14 were born in New York City or Brooklyn.

The place of birth was as follows: New York City, 39; Brooklyn, 9; New Jersey, 6; Boston, 2; Long Island, 2; Staten Island, 2; Connecticut, 2; Nova Scotia, 2; New York State, 2; Virginia, 1; Scotland, 1; Austria, 1.

The most of these children were born in cities or large towns, and, considering the effect of heat in relation to the disease, we should expect to meet with it more frequently in the large cities.

As to the effect of the station in life, dispensary statistics are of no value. From deductions which will be drawn later it should be more common among the lower classes, owing to the lack of hygienic surroundings and the frequent rapidity of childbirth.

Traumatism.—Of the exciting causes not already mentioned traumatism is probably the most important. This traumatism, be it observed, must occur in such a way as to cause the concussion of the spinal cord. Of the 64 cases in which the cause is given traumatism occurs 7 times, or in about 11 per cent of the cases.

The following table shows that of the 6 cases in which the time of the accident is noted, in 5 cases, or 83 per cent, the season of the year—August—furnishes a predisposing cause. In only 2 of the cases, that of the fight and of the child knocked down by the bicycle, was the accident very violent. In the 5 cases in which the onset of the fever is noted, in 3 it occurred either immediately or in a few hours, in the fourth on the second day; with the onset of the paralysis in 3 cases not later than

the third day, and in the fourth on the ninth day—so that in 80 per cent of these cases the length of time elapsing between the accident and the initial fever and paralysis would indicate the traumatism as the real exciting cause.

No.	Sex.	Age.	Season of year.	Exciting cause.	Onset of fever.	Onset of paralysis.	Extent of initial paralysis.	Extent of permanent paralysis.
1	Male.....	5 mos.		Let fall by nurse; green-stick fracture lower third of femur.			Right lower extremity.	Right lower extremity.
2	"	8 mos.	August	Fell out of bed several times.			Left lower extremity.	Left lower extremity.
3	"	10 mos.	"	Fell from baby carriage.	High fever in 2 weeks.	In 2 weeks.	Both lower extremities	Both lower extremities
4	Female..	16 mos.	"	Fell from high chair.	High fever at once.	Ninth day.	Both lower extremities	Both lower extremities
5	Male.....	2½ yrs..	December.	Violent fight	Immediate high fever; comatose.	Second day.	Entire body	Both lower and right upper ex.
6	"	3½ yrs..	August	Fell from high chair.	High fever second day	Third day.	Both lower extremities	Both lower extremities
7	Female...	3½ yrs..	"	Thrown down by bicycle in rapid motion.	In few hours.	Third day.	Both lower extremities	Both lower extremities

Exposure to Cold.—A small number of cases are due to exposure to cold, but it is rather the chilling of the heated body than the cold season. Three of my cases were due to this cause. The first, a girl of 3 years, whose mother had just died of phthisis pulmonalis, was found asleep in the garden with the ground frozen under her. This was followed by retention of urine and feces, with paralysis of both lower extremities. Another, a boy of 20 months, who had previously always been healthy, sat for a long time on stone steps, followed by paralysis of the entire body. He eventually recovered except the left lower extremity. The third case occurred in October: a boy 16 months old sat for a long time in a draught from an open window, the following day had fever and convulsions, paralysis followed on the third day. In another case, in a boy 2½ years old, the attack was said to have occurred after exposure to rain.

The frequency with which it is secondary to some acute febrile disease or the exanthemata is not so great as was formerly supposed. Two cases occurred after measles, 1 after varicella, 1 after scarlet fever, 3 after diphtheria, 2 after bronchitis, and 1 after pneumonia.

Heredity.—Does heredity play the same important rôle in the etiology of poliomyelitis anterior as in other nervous diseases—*i.e.*, were the parents or ancestors of these children affected by diseases of the nervous system?

Rosenthal says that not seldom the parents, especially the mother, suffer from nervous disorders. Sinkler states that in many instances there was a history of nervous disease in the family. Gowers believes that the influence of heredity is small. Seeligmüller thinks the statistics are insufficient. Erb declares that in the majority of instances there is no evidence of *any hereditary influence* or neuropathic tendency. The state of the child's health previous to the time of the attack would appear to be equally insignificant. "The disease occurs equally often in those who are enjoying the most robust health, and long-continued ill health seems to have but little influence in the production of the disease" (Sinkler). And, lastly, the only permanent effects of the attack are the local manifestations of paralysis with the accompanying wasting deformities, etc. "The general health of the patient remains remarkably good, the intelligence clear, and the disposition lively" (Jacobi).[1]

That the intelligence is clear and the disposition lively is wholly in accord with my own clinical observations. That "the general health of the patient remains remarkably good" is wholly at variance with what I have seen.

Tubercular Diathesis.—On entering upon duty in the neurological department of the New York Orthopedic Dispensary, three years ago, with little more than a theoretical knowledge of poliomyelitis anterior, the first thing to strike my attention, contrary to all that the text books taught, was the profound anemia of these little patients, accompanied in many cases with well-marked emaciation, a tendency to bronchitis, enlarged submaxillary and cervical glands, and the most obstinate eczema. This led to taking a careful history, not only of the patient, but also the family history when this could be ascertained. Again I was surprised by the frequency with which phthisis and other lung affections were noted. For, among all the descriptions of

[1] In his last edition, 1892, "Diseases of the Nervous System," Gowers says: "In the vast majority of cases the disease involves no immediate danger to life. But children are left with little power of resistance to other morbid influences, and occasionally succumb to some other illness, as an acute specific disease or an attack of bronchitis, a few weeks or months after the onset of the paralysis."

this disease, nowhere have I been able to find mentioned the possibility that the *tubercular diathesis* may be a predisposing cause. And on reading this paper before the Orthopedic Section of the New York Academy of Medicine, December 16th, 1892, I found that my records either as to the state of health of the patient subsequent to the attack, or those of the hereditary family histories, were so wholly at variance with the experience of the members present as to lead me to believe that the tabulated histories of these 75 cases, so far as I could give it, would at least be unique, and seemed an essential basis for the deductions which I had drawn.

The accompanying table shows the patient's state of health previous and subsequent to the attack, together with the hereditary family history:

SUMMARY OF CONDITION OF HEALTH BEFORE ATTACK—62 CASES.

Sickly	7	Constipation	8
Pale	8	Diarrhea	2
Thin	1	Leucorrhea	1
Jaundiced at birth	1	Urticaria	1
One of twins	2	Eczema	2
Always tired	1	Conjunctivitis	2
Subject to inflammations of respiratory tract	12		38

Delayed dentition, 20 cases given.....12—60 per cent.
Walking, late, 30 " " 13—43 "
Very stout.....10

Acute Diseases.

Pneumonia	2	Exanthemata:	
Diarrhea	2	Measles	13
Dysentery	1	Vaccinia	1
Convulsions	1	Varicella	2
Pertussis	4	Scarlet fever	1—17
Diphtheria	2	Total acute diseases	29

Healthy.....56 per cent.
Delicate 44 "

In 20 cases where date of the first dentition was given the average age was 9 months. In 30 cases in which the age is given at which the child began to walk the average age was 12½ months.

TABLE SHOWING NUMBER OF BIRTH.

Patient	oldest child		15
"	2d	"	5
"	3d	"	5
"	4th	"	4
"	5th	"	4
"	6th	"	1
"	7th	"	1
"	8th	"	1
"	9th	"	1
"	10th	"	1
			38

SUMMARY OF STATE OF HEALTH IN 72 CASES *after* ATTACK.

Healthy	12
Health impaired by some one or several of the following maladies	60
	72

Eleven of the 72 children were *very* stout.

Anæmia, simple, child well nourished	6
" with emaciation	21
" " inflammation respiratory tract	27
" " " intestinal "	22
" " obstinate constipation	10
" " vulvo-vaginitis	5
" tired all the time	2
" with enlarged tonsils and submaxillary glands	4
" " urticaria	3
" " eczema	7
" " conjunctivitis	2
" " perineal abscess	1
" " bowlegs	1
" " enuresis	4
" " nervousness	5
" " headache	6
" " migraine	3
" " strabismus	1
" " convulsions	3
Total	133

Acute Diseases since Attack.

Difficult dentition	1
Croup	1
Diphtheria	1
Measles	3
Scarlet fever	1
Meningitis	1
" tubercular	1



In comparing the summaries of the state of the patient's health before and after the attack, it must be borne in mind that these mothers were not all careful observers, and would report the child as well if it had not been seriously ailing, although every possible effort was made to eliminate this error. But, even with this fact in view, when we see that in 56 per cent of these cases the health was good previous to the attack, while in only 16.5 per cent, or about two-sevenths of these cases, did it remain good subsequent to the attack, we must infer that the malady had left a well-stamped impression on the general health.

In the 38 cases where the number of the birth of the child was given, in 39.5 per cent the patient was the oldest child; so that rapid childbearing as a predisposing cause of the tubercular diathesis could only be invoked in a small number of cases.

Comparing the manifestation of impaired health, manifestations of rachitis and scrofulosis, before the attack, including delayed dentition and locomotion, we find the number of these manifestations to be more than twice as great subsequent to the attack.

The mucous membrane lining the respiratory tract is seen to be the one most often involved in the inflammatory process, both before and after the attack, in the ratio of 9 per cent to 20 per cent. Next in frequency is that lining the intestinal tract. Obstinate constipation requiring constant treatment was present in 7.5 per cent of the cases. This disappeared with the improvement of the general health. The enuresis and vulvovaginitis did not yield so readily to treatment, while the skin lesions were still more obstinate. But by far the most intractable were the diseases of the respiratory tract with enlarged tonsils and submaxillary glands.

In those cases which were seen during or shortly after the attack, the conditions above noted were those that remained for some length of time while under observation.

The Family History.—Next to be investigated was the patient's family history, which was taken in 64 cases. The accompanying table gives a complete condensed statement of the same, when it was not given as "good" or "negative," together with the age of attack, condition of child's health before and after attack, also extent of initial and permanent paralysis. The summary is as follows:

Good		17
Negative		14
Some form of lung trouble, as follows:		
Phthisis in both paternal and maternal families		3
" 2 or more cases in paternal family		3
" mother died of		2
" 1 maternal uncle died of		1–9
" with various neuroses:		
" 1 uncle died of phthisis, and 1 of locomotor ataxia	1	
" maternal grandfather died of phthisis, 1 brother at two months of spinal trouble	1	
" maternal grandfather died of phthisis, oldest brother of convulsions	1–3	
" maternal grandfather died of phthisis, 1 uncle has hip disease	1	
Pneumonia in both families	1	
" 2 cases in mother's family	1	
" father died of	1	
Lung trouble, 1 paternal aunt died of		1–4
Hip disease, 1 maternal aunt died at 28, had hip disease; 1 brother has hip disease		1
Various neuroses as follows:		
Chorea, 1 sister has	1	
Sciatica, father has	1	
Hysterical, intensely, mother	1	
Inflammation of brain, uncle died of	1	
Tumor of brain, maternal grandmother died of	1	
Hydrocephalus, 1 brother died of	1	
Convulsions, youngest sister died of	1	1–7
Alcoholism, father habitual drunkard		3
Malaria (?), mother died of, while nursing patient, who was then 1 year,		1
Rapid childbirth, patient tenth child, three brothers died in infancy [of cholera infantum; patient eighth child, three brothers died of summer complaint		3
Kidney trouble, uncle died of; 1 brother congestion of lungs after pertussis		1
Abscess of liver, father died of		1
Total		64

Thus in 12 cases, or 18¾ per cent, there was a history of pulmonary tuberculosis. In 3 of these cases, or only about 3½ per cent, some form of nervous trouble was found in the same family: in 1 case the grandfather had phthisis and the uncle hip disease; in 1 case patient had an aunt die of hip disease and 1 brother has hip disease; the fathers of 3 patients were addicted to alcoholism; 2 patients were respectively *the tenth* and eighth children of mothers who had borne children *rapidly*. So in 18 patients, or 28 per cent of the entire number, the chil-



dren would have inherited a tubercular diathesis; for it is an accepted fact that both alcoholism and rapid childbirth are predisposing causes of tuberculosis and neurotic diseases. The various neuroses, aside from the families with a history of pulmonary tuberculosis, figure only to a slight extent—in 7, or about 9 per cent of the cases.

The above records are in accord with the theories advanced by Grasset in his article on "The Relation of Hysteria with Scrofulous and Tubercular Diathesis."[1] He claims "that the tubercular diathesis is essentially hereditary; and of the children of a tubercular subject, one may die of tubercular meningitis, one an ordinary consumption, while the third, who may have *seemed* to have escaped the diathesis, may be neurotic, hysterical, or lunatic even. And what proves that he is tubercular is that in his children the diathesis is still present and will often reassume its classic type, or he himself may become phthisical in the second half of his life; the two are simply successive manifestations of the same diathesis. The diathesis is first localized in the nervous system and is then manifested by the hysterical neurosis; next it invades the respiratory organs and determines a pulmonary tuberculosis. According to Jolly[2] it is the congenital debility which produces hysteria in the children of phthisical parents. As a matter of fact, in families where the diathesis prevails it is not those most debilitated by the hereditary taint who become hysterical, for they become consumptives of the common type. Those, on the contrary, who, at least temporarily, resist the pulmonary affection develop the neurosis. Hysteria may represent the diathesis in one member of the family, meningitis in another, and Pott's disease in a third."

That the theory of the tubercular diathesis manifested by various phases of the disease occurring in the same patient is not wholly fanciful, is shown in the following case, seen with Dr. Ketch on the fifth day after the onset.

The patient, aged 2 years, was perfectly well until July 4th, when a cannon went off next-door. The child gave a sharp, piercing cry, continued to scream for some time, and was very nervous the remainder of the day. On the following afternoon she was feverish and the nervousness continued; she walked well in the evening and slept well that night. On the second

[1] Brain, 1884. [2] Ziemssen's Cyclopedia, vol. xiv.

day she was disinclined to walk, dragged the left foot, and finally fell in the attempt. She complained of tenderness of the calf and pain in the limb.[1] Fifth day after the attack, the patient makes no effort to walk, and sitting up is painful. The patient has had no appetite since the invasion. The bowels have not been moved for three days; the bladder is normal. The pulse is 128; respiration 26, gasping; axillary temperature 101° F. There is tenderness along the spine, most marked in the lumbar region. The left lower extremity is cold and the muscles flabby. The growth of the left calf is seven inches, or one-eighth of an inch less than that of the right. Faradic irritability is wholly lost in all the muscles of the left leg, and galvanic irritability greatly reduced. This was the onset of an attack of poliomyelitis anterior, the paralysis being confined to the left lower extremity, the groups most affected being the anterior tibial, peroneal, and quadriceps extensor.

July 25th: Child lives in Brooklyn and was not seen again until to-day, with a history that on July 14th, or tenth day after the attack, a rash appeared on the back, neck, and head; on the following morning it had extended to the face, body, and hands. There were white spots in the throat, with difficulty in swallowing. It was diagnosticated "diphtheria with nettlerash." The entire body was swollen. In the following March I saw the child in the same condition, with enlargement of the tonsils—"urticaria edematosa." Note of this date: The child now seems well, but makes no effort to walk. The first voluntary effort to walk was made one month after the attack. At this time the patient was brought for regular treatment.

September 29th: The patient has coryza, with an axillary temperature of 99.8° F. The child was well nourished, the face was full and not markedly anemic, the eyes bright, the disposition lively. To the casual observer she had the appearance of a robust, healthy child. But from this time on the records show that the patient had not long apparently recovered from one malady until another appeared—laryngitis, bronchitis, and indigestion; leucorrhea was a constant and at times most troublesome symptom.

March 3d: History of night sweats, which were controlled by medicine. March 25th: The patient is suffering from pertussis, which proved very severe; it was complicated in

[1] The case was diagnosticated "hip-joint disease" by the attending physician.



April with an attack of urticaria edematosa, and in the latter part of May ushered in an attack of tubercular meningitis, of which the patient died June 9th. It was impossible to obtain an autopsy.

Having completed the history of the poliomyelitis anterior, we will go back to the family history. The parents are German. They are both living and healthy. They have had two other children. Of these, the oldest, a boy of about 6 years, has always been so thin and delicate-looking, also "subject to colds," that the father never thought he could live to grow up. The third child, a baby of 8 months, is also thin and anemic. One paternal grandaunt died of phthisis, and a paternal aunt, who was never very bright, now has phthisis. The history of the mother's family is good.

Personal History.—The patient was the second child. Was always perfectly healthy until 7 months, when she was dangerously ill of pneumonia. The cough did not disappear until the following summer, and after this she was never wholly free from cough except during the *very* hot weather. As a young baby she slept a great deal; until 8 months old slept all night and from 10 A.M. to 6 P.M. Was always soaked with perspiration. She was a stout, heavy child, and was 16 months old when she first tried to stand by chair, and began to walk at 18 months. The brother who was slight walked at 1 year.

In this case there was the inherited tubercular diathesis, favored by a serious attack of pneumonia at 7 months. Other predisposing causes were the age, 2 years, and an extremely hot July. The hygienic surroundings were good. The exciting cause was evidently psychical, the shock being caused by an unexpected and tremendous noise occurring in the patient's immediate neighborhood. After this time the child could not hear firecrackers or torpedoes going off without becoming exceedingly nervous.

The various manifestations of the tubercular diathesis in this case were: the abnormal amount of sleep and profuse perspiration while an infant; the severe attack of pneumonia at 7 months, leaving the respiratory mucous membrane subject to inflammation; the poliomyelitis anterior at 2 years, to be followed 8 months later by an attack of pertussis, which, although mild in its onset, ushered in the fatal attack of tubercular meningitis.

1. That the family histories show, in some cases, pulmonary tuberculosis in both families; in others, in two or more cases of the same family; in a third group; pulmonary tuberculosis in one member of the family, with a well-marked neurosis in the second. Another well-defined tubercular disease present was hip-joint disease. 2. From the patients' histories, that while poliomyelitis anterior is characterized by a well-defined lesion of the anterior horns accompanied by various local manifestations of muscular atrophy, deformity, etc., the occurrence of the disease causes a well-marked impairment of the general health and increases the liability to succumb to any incidental malady, as measles, pertussis, etc.

Infection.—The only remaining cause not yet touched upon is the extremely interesting and highly probable theory of the infectious nature of poliomyelitis anterior. The theory was suggested by Seeligmüller in his brochure on "Infantile Spinal Paralysis" of 1880. He would account for the localization of the virus in the anterior horns of the cord by the more active circulation here, due to the frequent movement of the extremities.

Three kinds of evidence give proof of the infectious character of a disease: the discovery of the micro-organism which causes the disease, the undoubted contagiousness or an epidemic of the disease, and, third, the general clinical picture of the disease. It is the last named that has so often suggested the infectious nature of the disease. Strümpell says: "The whole course of the disease makes the hypothesis very probable that we have to do with an acute infectious disease, with an infectious process which first causes a general infection of the body and then is localized chiefly in a circumscribed portion of the spinal cord."

Cordier[1] was the first to report an epidemic of this disease, which he had seen, and which occurred during the months of June and July, 1885. In this time, in a village of 1,500 inhabitants, there were 13 cases, 4 of which were fatal. The infectious agent was believed to be the inspired air. The cases cited to show the contagious nature of the disease are: One child was attacked thirty-six hours after a visit to another who was already suffering from the same malady. In two other cases a

[1] Lyon Médical, 1888.

boy and his sister were exposed, and the first evidences of the disease were apparent only eight to ten hours afterward.

Cordier argues for the infectious nature of the disease from the facts that the malady generally occurs during the hot weather; its sudden onset; its truly cyclic progress; its well-limited, definite lesion; and the simultaneous occurrence of several cases in the same family. Other cases of simultaneous attacks in the same family are reported by Seeligmüller, 3 twins; Meyer, twin brothers after measles; Hammond, 2 brothers; Simon, a case where 3 children in one family were suddenly attacked, 2 in one day and 1 in twenty-four hours. Dr. Brieglob[1] publishes 5 cases which occurred in a district of Thuringia, 1 in the beginning of June and the remaining 4 in the beginning of July, 1889. He adds further that, on looking up the journal of the district, or polyclinic records, there were no cases of poliomyelitis recorded previous to this time, and the first that occurred after was in March of the following year. The rarity of the simultaneous occurrence of 2 cases in the same family may be accounted for by the fact that the child attacked is usually the youngest, and the other children have reached an age which seems to furnish a certain immunity against this disease.

(To be continued.)

SHOULD MARRIAGE BE RECOMMENDED AS A REMEDY FOR DISEASE IN WOMEN?[2]

BY

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I VENTURE to offer some objections to the not uncommon advice given by many physicians to their women patients—that of recommending marriage as a remedy for certain uterine and nervous diseases. That the marriage relation is a normal one to exist between the sexes cannot be gainsaid, but when we con-

[1] Inaugural dissertation, "Ueber die Frage der infektiösen Natur der acuten Poliomyelitis," 1890.

[2] Read before the Obstetrical and Gynecological Society of Washington, May 6th, 1892.

one can but be shocked by the suggestion of a resort to it as a cure for disease, and it indicates a poverty of remedial resource on the part of him who recommends it. In these degenerate days, when the matrimonial bond is worn so lightly, it behooves the physician to consider how far he may be responsible for some of the large number of divorce proceedings entered in our courts.

I start out with the idea that it is extremely problematical that marriage is a remedy for *any* disease. I am aware that some cases of dysmenorrhea have been relieved by parturition; but in those very cases of dysmenorrhea for the cure of which marriage is recommended, the cause of the condition, stenosis of the cervix, is unfavorable to conception. And, besides, I have known cases of painful menstruation that were in no sense ameliorated by childbirth. I do not believe that any guarantee can be given that marriage will cure any disease, but, on the contrary, it is frequently necessary to forbid marital intercourse in order that cure may be effected. Hence it would seem the height of unwisdom to even suggest marriage as a means of relief from disease. The intent and purpose of marriage being the procreation of species, and for the fulfilment of that purpose it being necessary that the reproductive organs should be in a healthy condition, then how can any one justify the advice, "get married and you will be cured"? It is offering an inducement to a woman to enter into an alliance that she might not otherwise undertake, for the sake of hoped-for relief from her intolerable periodic suffering, to say nothing of the injustice that might be done the victimized husband. Only a few days ago a lady told me that she had always suffered excruciatingly at her menstrual periods, for the cure of which marriage had been recommended. Great was her dismay to find that notwithstanding her marriage she continued to suffer, even more than she had done before. She then learned that childbirth was necessary to bring relief. So when conception finally occurred her pleasure was a double one—the expected emancipation from periodic suffering and the prospect of a child. Of course menstruation was suspended during pregnancy and lactation. Finally, when the catamenia returned, horror of horrors! there was the same old pain without the least mitigation of its poignancy. Although some years have elapsed since the birth of her child, at every monthly



period she spends two days in bed, and, while she is not anxious to grow old, she is longing for the climacteric as her only hope without some operative procedure. She has not become pregnant a second time.

Another case, Mrs. J., an intelligent, vivacious brunette, suffered much at her monthly periods. She was married when 20 years old to a physician, and became pregnant after three and a half years. She was delivered of a healthy girl baby after a tedious labor, but her recovery was retarded, as she had "puerperal fever." She somehow became addicted to the use of opium, and took incredible quantities of morphia hypodermically, as much as a drachm vial lasting her only a week. Her husband died a few months after her child was born. She had no return of her menses for five years, but during the last two years of this period she had copious bleeding from her rectum every three or four months. She had internal hemorrhoids. She was finally cured of the morphine habit, and then the uterine flow reappeared at irregular intervals, finally becoming regular, but the flow was always attended with great pain. She married a second time about eighteen months ago. She has not become pregnant, and continues to suffer at each menstrual period.

Miss K., a robust, voluptuous-appearing young lady, was subject to violent headaches and occasional hysterical manifestations; these last were attended with horrible hallucinations. During these attacks her suffering seemed to be great and her condition was pitiable in the extreme. She married, but the hysterical manifestations continued. Recently I have lost sight of her, but she did not become pregnant, so far as I know.

Mrs. A. was apparently a healthy, robust woman, the wife of a well-to-do farmer living in Virginia. Prior to her marriage she had given no evidence of hysterical tendencies. She had two children within twenty-one months after her marriage. Each time she became pregnant she had frequent hysterical swoonings, which continued at intervals for several weeks. These attacks were at first very alarming to her husband, who had had no experience with such manifestations, and when informed that they were hysterical his disgust was extreme. I do not know that any hysterical element was present in any subsequent pregnancies, as I lost sight of the patient.

Mrs. M., a nervous, impressionable woman, suffered greatly from dysmenorrhea, her periods being accompanied by marked

hysterical explosions. Her physician advised her that marriage would bring relief. After the birth of her first child she had no further menstrual pain, but at times she had hysterical developments. She is now pregnant for the fifth time, being about two months advanced, and a few days ago had pronounced hysterical manifestations.

These few cases thus briefly related may not prove anything within themselves, but they are examples of others that I might cite, and no doubt every physician is familiar with some of the same kind. They seem to show that marriage is a most unreliable remedy for these diseases. Indeed, my own belief is that marriage has a tendency to increase the pain of dysmenorrhea by direct irritation causing excessive hyperemia, and to aggravate nervous conditions by reflex over-stimulation of the nervous system.

3 THOMAS CIRCLE.

CAVERNOUS ANGIOMA OF THE UTERUS,

WITH SPECIMEN, AND REMARKS ON THE METHOD OF DOING VAGINAL HYSTERECTOMY.[1]

BY

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(With six illustrations.)

ANGIOMATA in various portions of the body are quite common, and the theories as to their origin vary as much as do their varieties. In the uterus the existence of such neoplasm is exceedingly rare, and I therefore take the liberty of presenting the specimen.

The patient from whom it was obtained is 37 years old and a nullipara. For nearly a year she had been bleeding more or less, the hemorrhages during the last four months being profuse and the intervals short. A number of curettings with a sharp instrument, with short intermissions, had only a temporary effect

[1] Read before the Section on Gynecology and Abdominal Surgery of the Pan-American Medical Congress.

on the metrorrhagia. The endometrium showed nothing malignant; only a hyperplastic endometritis could be diagnosed with the microscope. The bleeding finally became so profuse about the time of the "should-be menstruation" that I, in view of the previous failures to cure with the curette and local applications, resolved to do something radical, especially as the patient was becoming very anemic and righteously discouraged. Vaginal hysterectomy was decided upon, rather than castration, because of the probability that the chances of cure for the patient were certain if the operation was recovered from; and, second, although no malignancy could be shown as yet, it seemed rather suspicious for the bleeding to recur so persistently shortly after curetting.

After proper preparation of the patient, the operation was done by the method which I have described as ideal on a former occasion.[1] Owing, however, to the variance of opinions expressed recently, by different writers, as to the proper method to employ, I feel called upon to again say a few words on the subject. No fixed rule can be put down, but each case must be managed according to the circumstances presenting themselves. We will take an ordinary case, such as our instance. It is immaterial whether it be malignant or non-malignant disease for which the operation is done, as far as the one feature is concerned —namely, the closing the wound *completely* and to have the broad-ligament stumps entirely *extraperitoneal*. The portio is grasped with a volsella and the uterus pulled down as much as possible, when a transverse incision is made anteriorly through the vaginal mucosa and the bladder stripped off the cervix; if it cannot be completely done yet, only so much is separated as is convenient. The same course is pursued posteriorly, and the cul-de-sac of Douglas is opened. The peritoneum is now attached to the vaginal mucosa by a continuous catgut suture. The bases of the parametria are next ligated and cut on either side; it will now be found an easy matter to detach the still remaining part of the bladder from the cervix, when the peritoneum is attached to the vaginal mucosa anteriorly, the same as was done posteriorly.

The broad ligaments are now ligated in sections and cut as we proceed, taking care that the needle enters the vaginal mucosa, and, taking in its bite as much of the broad ligament as is desired,

[1] See "Vaginal Hysterectomy for Cancer of the Uterus," AMERICAN JOURNAL OF OBSTETRICS, October, 1892.

is then made to emerge again in the vaginal mucosa. Another stitch is taken in the texture already surrounded by the ligature, which prevents the possibility of the main ligature slipping off the respective stump. The ligature is now tied and the ligated portion cut through. We next proceed likewise with the other side, and so on until we have nearly reached the summit, when we also bring down the adnexa, if possible, and place our last ligature. It is obvious that by following this technique of introducing sutures our stumps are practically already secured in the vagina. It is also shown that delivery of the uterine body anteriorly or posteriorly is not resorted to. The organ having been removed, the terminal ends of the broad ligaments are grasped with bullet forceps and an assistant makes sufficient traction to bring them completely into the vagina, when another suture is passed on the same principle as the previous sutures, enveloping *all* the stumps; this done on either side, the centre gap can now be closed completely after removing the sponge or gauze tampon from the pelvic cavity, if one has been inserted to prevent the intestines from prolapsing during operation. Full-curved, sharp needles of suitable size are used, and nothing but catgut for ligatures. Silk delays the convalescence very much, and it cannot be made more aseptic than the animal ligature, which latter can be tied just as securely and is not absorbed too soon. The needle-holder is also preferable without a catch.

There is no necessity of drainage in ordinary cases, so that the practice of putting in a strip of gauze for this purpose in every instance had better be abandoned. I personally always feel safest when everything has been closed. Of course, if extensive adhesions were present, it is safer to put in a piece of gauze and drain for a few hours.

In malignant disease the operation must be done as far away as possible from the diseased structure, and sufficient vagina must also be resected if the portio is the seat of the neoplasm. *Clamps should never be used if ligatures are applicable.*

The operation should be done with the patient in the lithotomy position, and not in the side posture as is advocated by some.

After removal of the particular specimen under consideration it was halved anteriorly, when a tumor was found, the size and shape of a medium-sized English walnut, located in the anterior upper corner of the organ, reaching to the fundus. The tumor

was bulging toward the uterine cavity, and there appeared lobulated, of a dark mahogany-red color, and of a consistence somewhat firmer than that of the surrounding uterine walls; it extended, especially in its posterior portion, a little more than half the thickness of the uterine wall. Its transverse section appeared mottled, exhibiting a large number of dark-purplish spots together with whitish spots, both of which varied in diameter, from the transverse section of the quill of a raven's feather down to the smallest pinhead. To the touch the purplish spots appeared soft, corresponding to the consistence of recently

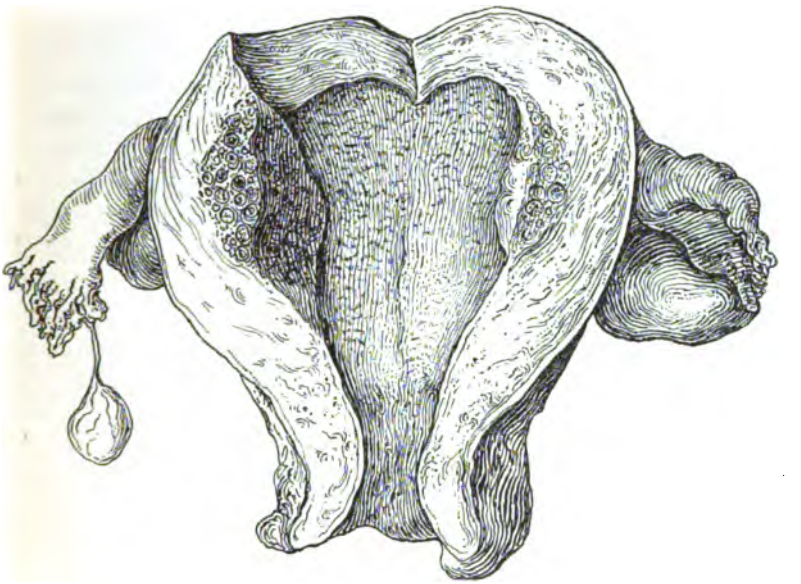


FIG. 1.—Cavernous angioma of the uterus. Two-thirds the natural size.

coagulated blood; whereas the consistence of the whitish spots was very firm, almost approaching that of cartilage. Still more conspicuous was the difference in the color of the circular spots in their transverse section through the tumor, where the dark-purple or blood-colored circular fields were distinctly marked from the whitish fields alluded to (see Fig. 1).

With low powers of the microscope the most striking feature was an abundance of large cavities, greatly varying in size and shape, filled with blood. Obviously these were transverse sections of large veins separated from one another by intervening fibrous connective tissue, in which a considerable number of capillary

blood vessels could be seen. The amount of blood was by no means uniformly distributed throughout the veins, some of which showed a clot of blood consisting mainly of red blood corpuscles and comparatively little fibrin; other cavities, on the contrary, held a good deal of fibrin and serum, but not many red blood corpuscles. This peculiar fact may be accounted for by the circumstance that the flow of blood was not uniformly accessible to all constituent veins of the tumor, a number of veins being partially or completely obliterated, and consequently causing an obstacle to the circulation of the blood even within

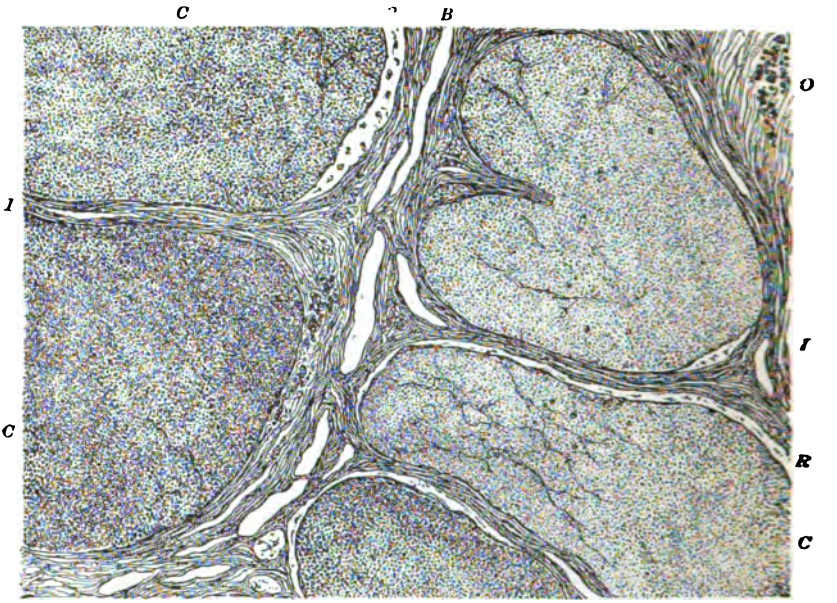


FIG. 2.—C, C, cavernous veins filled with blood and coagulated fibrin; I, I, interstitial fibrous connective tissue; B, capillary blood vessels in the interstitial tissue; R, R, light, highly refracting rims along the walls of the veins; O, obliterated blood vessel marked by clusters of pigment.

the permeable portions. Since with high powers of the microscope the endothelial wall of the permeable cavities could be seen without difficulty, the nature of the tumor must be defined as that of a cavernous angioma (see Fig. 2).

Around a number of transverse sections of the cavernous veins peculiarly glistening veins could be seen occupying either small portions of the wall or ensheathing more or less of the periphery. These veins proved to be the incipient signs of ob-

literation. The capillaries of the interstitial connective tissue were found to vary greatly in size, and mostly empty. Around some capillaries, however, likewise narrow, light veins could be seen, closely resembling those at the borders of the venous cavities; and as the capillaries surrounded by such veins were of a very narrow calibre, the inference could be drawn that these capillaries were likewise in the process of obliteration. Similar features were found around the scanty, tortuous arteries present at the border of the tumor toward the muscle wall of the uterus. The image of such arteries is that described by pathologists as waxy degeneration of the arteries. The interstitial connective tissue holds, in different though not extensive places, a dark yellow-brown pigment which probably is the outcome of previous extravasations of blood. In other portions there are larger masses of pigment clusters, which, from the configuration of the fields holding such pigment, must be considered as the last residues of obliterated cavernous veins. The large venous cavities penetrate into the muscle wall of the uterus, as already stated in the naked-eye appearance. The tortuous arteries and the enlarged capillaries are most numerous at the periphery of the tumor. There is no distinct boundary line between the most peripheral cavernous veins and the adjacent muscle tissue, which latter directly borders the venous cavities. Small, light patches in the interstitial connective tissue admit of no other explanation but that of being completely obliterated arteries or capillaries.

Considerable interest attaches to the obliteration of the cavernous veins throughout the tumor. Whether or not the involution of the veins was due to the repeated scraping and subsequent application of carbolic acid I am unable to say with positiveness, but presumably this is the case. A number of the obliterated veins appear of such peculiar shape that the idea forces itself upon one's mind that the venous cavities must have been in a collapsed condition at the time when obliteration began. Another possibility is that some parts of the tumor were deprived of blood by a preceding obliteration of a certain number of venous cavities, which likewise may have resulted in the locking-up of the blood current and collapse of the veins thereupon (see Fig. 3).

All veins, either in the process of obliteration or thoroughly obliterated, are marked by hyaline or waxy rims around the

walls. Such rims are occasionally found doubled, or even trebled; in the latter instance a narrow rim of medullary tissue can be traced between the waxy layers. The central portions are occupied either by myxomatous or by fibrous connective tissue, and in the latter instance the fibrous tissue is often found in hyaline or waxy degeneration. Occasionally a portion of the calibre of the vein remains permeable to blood, whereas a large amount of the previous calibre has disappeared, being transformed into one of the named tissues. Again, these tissues are



FIG. 3.—Cavernous angioma of uterus. Obliteration of veins. Mag. 50. P, P, permeable cavernous veins filled with blood; H, half-permeable vein; S, solidified cavernous vein; R, R, hyaline rim around both permeable and solidified veins; O, completely obliterated vein; I, I, interstitial fibrous connective tissue carrying capillary blood vessels.

often found intermixed with medullary tissue, which in our specimen is conspicuous by a marked stain with ammoniacal carmine, while the waxy portions take no carmine or very little of it. Another feature is the varying breadth of the waxy rim, which at one periphery may be broad, occupying almost the whole previous calibre of the blood vessel, whereas the opposite periphery is occupied only by a narrow rim. The waxy rim is not always continuous around a vessel, since small portions may be lacking and are replaced by delicate fibrous connective tissue

blending with that in the interior of the obliterated vein. The last outcome of the tissue changes is apparently a more or less circular spot, altogether made up of fibrous connective tissue holding either clusters of pigment or small, tortuous, obviously newly formed capillary blood vessels.

In order to comprehend the process of obliteration we may resort to somewhat higher powers of the microscope (see Fig. 4). Here we notice a convoluted hyaline rim, closely reminding one of the residue of a Graafian follicle after its rupture in the

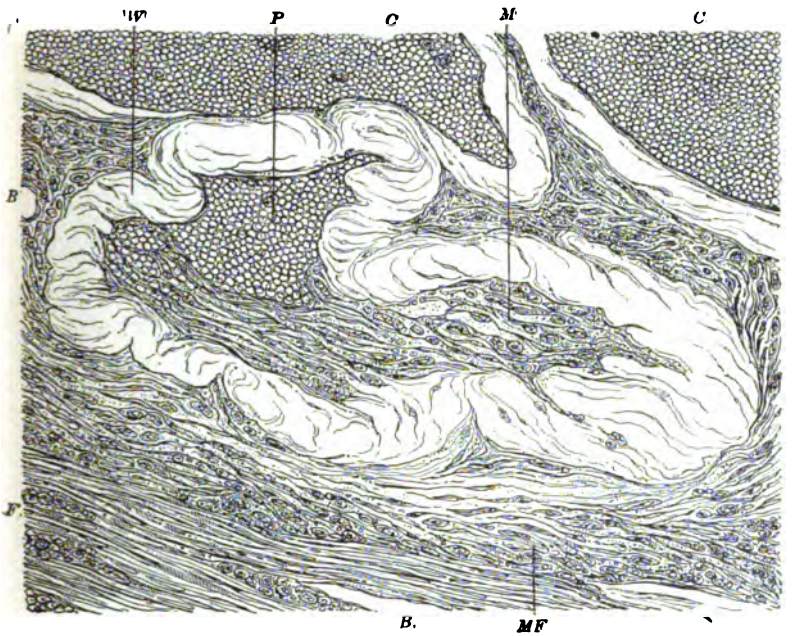


FIG. 4.—Cavernous angioma of uterus. Obliteration of vein. Mag. 200. W, wall of vein in waxy infiltration; P, permeable portion of calibre filled with blood; M, myxomatous tissue filling the interior of vein; C, C, cavernous veins bordered by a rim in waxy infiltration; F, fibrous connective tissue; M, F, myxofibrous connective tissue; B, B, capillary blood vessels.

process of ovulation. In the latter instance the possibility suggested itself that the light, convoluted rim, filled with myxomatous tissue, might be the remnant of the elastic or basement membrane after encircling the Graafian follicle as the boundary zone between the epithelium and the vascularized theca follicle, which is nothing but fibrous connective tissue. No such possibility can be thought of in the veins. Here we might resort to

the hypothesis that the albuminous portion of the blood became soaked into the wall of the vein, rendering it homogeneous and glossy. The wall is never structureless, but invariably shows delicate striations and interspersed protoplasmic bodies. In our instance the calibre of the previous vein is in a measure still preserved and permeable to blood. The greater amount, however, is solidified and transformed into a myxomatous and myxofibrous connective tissue. The latter is unquestionably the outcome of a proliferation of the endothelial wall

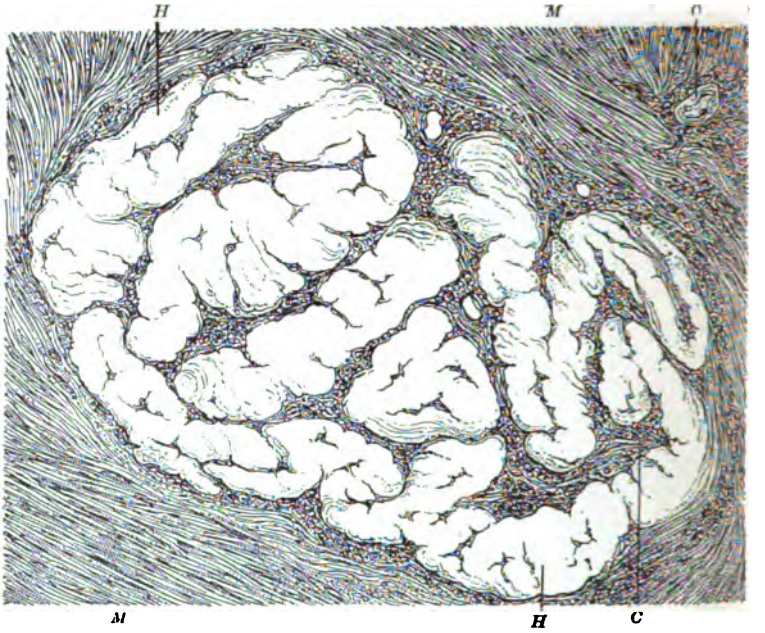


FIG. 5.—Obliterated vein in cavernous angioma of uterus. Mag. 200. H, H, hyaline convoluted tracts; C, medullary and fibrous tissue between the convolutions; M, M, smooth muscle bundles of uterus; O, obliterated capillary or artery.

of the vein, much in the same manner in which arteries are rendered solid in the process of endarteritis obliterans, by an outgrowth of the endothelium, the so-called intima of the artery. Around the partially obliterated vein we see myxofibrous tissue, obviously the outcome of an inflammatory process accompanying or preceding the obliteration of the vein. Then follows the smooth muscle wall of the uterus, in which we observe in the interstitial connective tissue clusters of medullary or inflammatory corpuscles, either the outcome of inflammation or the

first step toward new formation of cavernous angioma, leading to an extension of the tumor from its periphery. There are good reasons for upholding the latter view, especially because of the presence of hematoblasts or undeveloped red blood corpuscles within the medullary nests. To-day it is fully admitted that Rokitansky's assertion, made fifty years ago, that the formation of red blood corpuscles precedes the formation of cavernous angioma, is correct.

How peculiar the outcome of obliteration of a cavernous vein

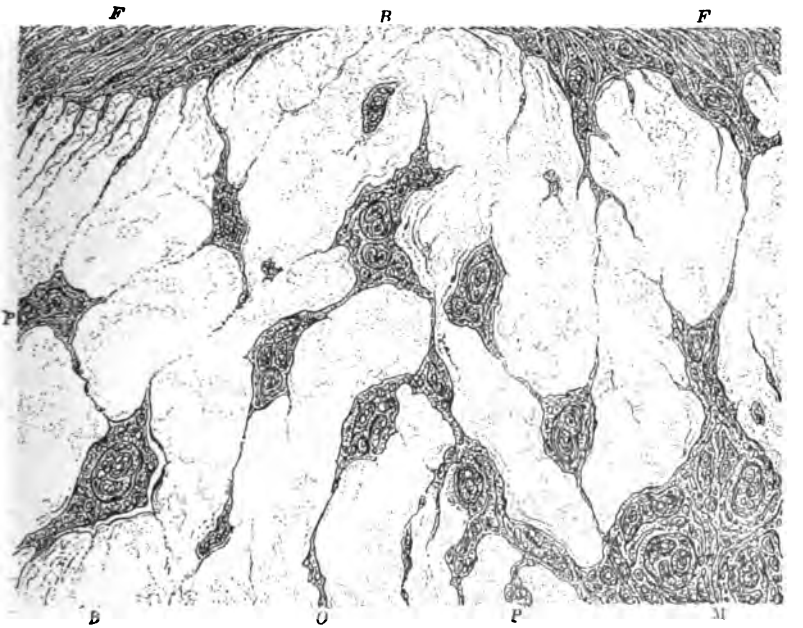


FIG. 6.—Cartilaginous rim of obliterated vein in cavernous angioma of uterus. Mag. 600. M, medullary tissue in centre of obliterated vein; F, F, fibrous tissue on the outer periphery of obliterated vein; P, P, coarsely granular protoplasmic bodies; O, offshoot of protoplasmic body; B, B, cartilaginous basis substance.

may be is shown in Fig. 5. Here the convolutions of the waxy rim are so pronounced that the idea almost forces itself upon one's mind that the vein must have been collapsed and empty before the process of obliteration had started. The convoluted rim here is but faintly striated, and carries a limited number of branching protoplasmic or fibrous tracts. This means a high grade of waxy infiltration. Between the convolutions we notice tracts of medullary tissue intermixed with fibrous

connective tissue. The supply of this tissue with capillary blood vessels is small. The whole formation is surrounded by a zone of medullary tissue directly bordering upon unchanged smooth muscle tissue. In the left upper corner we notice a waxy patch, evidently an obliterated capillary or artery.

What the waxy rim is can be determined only with higher powers of the microscope (see Fig. 6). Here we see protoplasmic tracts traversing the glossy basis substance in different directions, being in connection with the medullary tissue occupying the central portions of the obliterated vein, and with a more fibrous connective tissue surrounding the outer periphery of the waxy rim. The protoplasmic tracts are conspicuous by a large number of nuclei and an abundance of coarse granules of living matter. No regularity prevails with regard to either the size or the shape of the protoplasmic formations, although they remind us of pathological cartilaginous tumors, the so-called chondromata, which occasionally are likewise found traversed by irregularly branching protoplasmic tracts. From a histological standpoint I, indeed, would not hesitate in comparing the waxy rims of the cavernous veins with an anomalous formation of cartilaginous tissue in certain chondromata. The basis substance is in both instances not devoid of structure, but traversed by an exceedingly delicate reticulum of living matter, discernible with a power of six hundred diameters, in the shape of branching tracts of minute granules.

I have dwelt upon the histological minutiæ of this case somewhat at length for two reasons. First, only one other case of cavernous angioma of the uterus is as yet on record, that described by Klob in his "Pathologische Anatomie der weiblichen Sexual-Organe," page 173, viz.: The uterus was anteflexed, its substance reddish-yellow, flaccid, and traversed by rigid arteries. In the posterior wall there was a circular, elevated portion, of spongy softness and two centimetres in diameter; the mucous membrane covering it was thin, slightly "hob-nailed," and of bluish-red transparency. The corresponding peritoneal surface was also tumefied, convex, of bluish transparency, and the blood vessels of the peritoneum were very distinct and full. A section made through the tissue was immediately covered with dark fluid blood, after removing which a delicate framework, with isolated dark spots, became visible. In the cavities within this framework and communicating with

each other there was fluid blood. The appearance of this tumor on the whole, therefore, resembled the cavernous ectasiæ so frequently met with in the liver, excepting that the framework was much thicker than is usual in similar vascular tumors. The framework itself consisted of smooth muscular fibres enclosed in connective tissue, and was covered in some places with cells resembling pavement epithelium. In some portions of it there was an outgrowth of connective tissue in the form of densely crowded papillæ without arborescence. A communication between the cavity of the tumor and the neighboring veins could easily be demonstrated, and at its borders a gradual transition into the flaccid uterine tissue was unmistakably recognizable, partly from the entrance of enlarged veins. The rest of the uterus exhibited marked evidences of previous labor, and both ovaries contained large white bodies (corpora albida), indicating that pregnancy had previously existed. I do not hesitate to believe that this cavernous ectasia was developed from the point of placental attachment, and I do not doubt but that this was a case of paralysis of the above-mentioned point after labor, this portion of the uterus not having undergone regular involution, whilst the rest of the organ had returned to its normal condition; and that the external muscular layer near the peritoneum disappeared, partly from involution and partly from marastic atrophy of the uterus, in such a manner that finally the entire wall of the organ was transformed into this cavernous ectasia.

The resemblance of this case is so strong to mine that I have quoted it in full in Klob's own words. Whether his conjecture as to its causation is correct I am unable to determine; it is, however, certain that the uterus containing the tumor described by me showed no evidence of previous pregnancy.

Such tumors are of rare occurrence, most frequently found in the stroma of the liver, in the derma, and in the mucous membranes. They are either stationary or slowly spreading, and, although of a benign type, they may be accompanied by excruciating pain. The first to accurately study cavernous angioma was Rokitansky, who, as stated before, maintained that a new formation of red blood corpuscles accompanied, or even preceded, the formation of the tumor. This assertion was contradicted, some forty years ago, by Virchow, but it is to-day generally admitted to be correct.

The second point of great biological interest in my case lies in the process of involution of the cavernous veins. From the facts described I have but little doubt that the tumor was slowly progressive, though partially, at least, healing up by the obliteration of a number of veins. In consequence of the almost constant bleeding, extirpation of the organ was a perfectly legitimate procedure. If, however, the correct diagnosis could have been made (which was an impossibility), another course of treatment would probably have given us a satisfactory result —namely, the application of the actual cautery to the tumor after dilatation of the cervix.

Another deduction may be made from this case—that it was not the curetting which gave the temporary relief so much as the local use of pure carbolic acid. On the contrary, the bleeding was always quite profuse when the curette was used. This would correspond, too, with the lesion.

No. 51 WEST 52D STREET.

REPORT OF A CASE OF OVARIAN TUMOR COMPLICATED BY ENCYSTED REMAINS OF TUBAL GESTATION ON ONE SIDE AND CALCIFIED OVARY ON THE OTHER.

BY

MARCUS ROSENWASSER, M.D.,

Professor of Diseases of Women and Abdominal Surgery, University of Wooster, Cleveland, O.

MRS. J. S., 42 years old, consulted me during the latter part of May, 1893, for excessive trouble with urination, a difficulty that had been growing worse for the past five months. She felt as if she could void urine every minute—not when sleeping, but when about, or sitting down, or lying awake. Constipation, to which she had been subject now for two years, had become extremely painful the past few weeks. Lately she felt exhausted, tired out, suffering much with headache. Her menses were regular, quite scant, but painless excepting the last, which was attended with pains resembling those of labor. During the winter her face was often flushed and felt so hot that she sought relief in frequent washing with cold water. She attributed

these flushes to the coming change of life. She had been married twenty-three years and was the mother of three children—21, 16, and 11 years old respectively. Her first severe illness dates back about eighteen years. She had gone two weeks over her regular time of menstruation; had noticed nothing unusual, except that she had an abnormal craving for pickles, of which she ate freely in the evening. The following morning, after breakfast, she was suddenly seized with an indescribable pain, resembling the last pain in labor, accompanied by a sharp, tearing sensation through the womb. To use her own words: "It bore me down to the ground; I fell over and screamed, was picked up and placed in bed, and hot plates were put over the abdomen. I then began flowing profusely, both blood and clots. The pains, of a bearing-down character, continued, intensified by the lancing, sharp pain for several days. The doctors said it might be a miscarriage, but no fetus was found, although they were on the lookout for it. My abdomen gradually swelled, until at the end of two weeks I was as large as at term. I was treated for peritonitis and was in bed for three months." After a few more weeks of convalescence she recovered and considered herself perfectly well, attending to her household and to the grocer's shop which was conducted in the same house. Excepting the inconveniences of two subsequent pregnancies, she enjoyed good health until six years ago. Her menstruation had been regular, but she had gradually grown constipated. One night, after several weeks of obstinate constipation, she took a dose of castor oil, which moved her bowels freely, but was attended by abdominal and womb pain resembling her former attack. The next morning she was "motionless" with peritonitis. She knows she was not pregnant at this time, as she had been regular, and flowed regularly during the subsequent illness. I saw her as one of her consulting attendants during this attack. There was a fluctuating tumor in the recto-vaginal pouch, filling the pelvis and bulging into the vagina. The pelvic floor seemed much attenuated, inviting to puncture. She was removed to a hospital, and the tumor was aspirated by Prof. G. C. E. Weber under the impression that it was a pelvic abscess, but the contents proved to be a clear, limpid fluid, changing the diagnosis to cystic tumor. She left the hospital in a week, but the recovery was slow. It was fully three months before she felt herself well enough to resume her household

cares. She never felt as strong or quite as healthy as formerly, but was satisfied with herself until distressed as related above.

At time of examination she looked sallow, pinched, emaciated. The bimanual revealed the uterus somewhat retroverted, attached to a fluctuating tumor in the posterior cul-de-sac. A little to the right was felt an elongated body which resembled an enlarged tube. Rectal touch confirmed this observation. The larger tumor was quite painful on firm pressure and seemed thoroughly wedged in between the rectum and the uterus. I attributed her suffering to pressure, and advised removal of tumors by abdominal section.

Operation, June 6th. Chloroform was used. The cyst was firmly adherent in pelvis and to broad ligament, which latter was cut away together with cyst, as there was no pedicle. The appendix was attached to the tumor, but, being normal, the temptation to remove was reluctantly resisted. Extending from left into the right side was the occluded left tube; its ovary, in its proper place, felt very hard. These were also removed. The cyst contained a thin, amber-colored fluid. At the extreme right of the ovarian cyst there was an encysted body with gritty contents. On opening this the contents proved to be skeletal remnants of a fetus. The hard ovary, on cutting through the cortical layer, disclosed bony structure. With the exception of symptoms of bowel obstruction, which were overcome on the third day, and a mural abscess, recovery was uneventful. Patient left the hospital on July 3d, twenty-seven days after operation, perfectly recovered and relieved from her former distress.

The specimens were sent to Prof. F. Byron Robinson, of Chicago, for examination. His report is as follows:

DEAR DR. ROSENWASSER:

The very interesting specimens which you kindly sent to me for examination consist of two Fallopian tubes and their ovaries, and part of their broad ligaments, preserved in full-strength alcohol.

The right tube is five inches long. The tube has been laid open in two places and stitched together. The whole broad ligament is thickened and covered with ancient deposits of peritonitis. The broad ligament adjoining the uterus is much thickened by inflammatory products. Its connective tissue is increased and its blood vessels are enormously dilated. This

broad ligament shows that it has gradually thickened through long periods of time, from the nature of the new connective tissue. A few vertical tubes of the parovarium are visible in one spot of the broad ligament. The tube is irregular in its outline. One inch from the uterine end is an irregular swelling, 1x½x½ inch; on laying it open one can see that it is the thickened, hypertrophied tubal wall. It is definitely the tubal wall, as I can strip it easily away from the peritoneum of the broad ligament. The consistence is quite hard, and it appears to be fibroma of the tubal wall (two of them). Three inches from the uterine end of the tube another swelling appears on the tube. On laying open this swelling there appeared a cavity, 2x¾x½ inches, of an oval form. The cavity contained between thirty-five and forty distinct and separate bones. The ribs were about one-third of an inch long. The bones were in all stages of necrosis. Many long bones had made a deep bed in the wall of the tube, and the tissue in the upper portion of the tubal socket had tightly closed around the bone, so that the bone resembled the femur in the acetabular cavity. I have frequently observed this same process in retained fetuses in the sow's uterus. The bones all begin to crumble from the ends. The skull bones are plainly preserved. The patella exists entirely hollow. The whole tubal sac is made uneven by pits, due to the ends of the bones pressing into the tubal wall. Parts of the tubal wall are smoother from expansion of the tube obliterating the plicæ of the lumen. In irregular patches may be observed enormously hypertrophied tubal plicæ. These plicæ were intimately connected with groups of entangled bones, and occupied wide and deep pits in the tubal wall. A yellow color exists over the entire sac. The fimbriated tubal end has entirely closed with white, solid connective tissue, so old and solid that not one fimbria is visible. All the fimbriæ are obliterated by progressive inflammation and its products. A curious feature in regard to this tube is that the portion lying between the two swellings has not the vestige of mucous membrane left. It seems that this portion of the tube has been so dilated and stretched that fluid pressure has obliterated the mucous membrane entirely. I can distinctly, however, see the inferior circular muscular fibres of the tube lying under a transparent membrane—the remains of the endosalpinx. The sac containing the ectopic skeletal remains has a thick wall of white connective tissue, about twice as

nizable structure lying at the tubal end and smelted with it. Some old scars can be seen marking the site of a ruptured Graafian follicle. The tube, then, demands attention at three points: (*a*) the double pea-sized swelling at the uterine end, which no doubt blocked up the tubal lumen (it might be an old tubal pregnancy); (*b*) the thin-walled portion of the tube between the two tubal swellings, whose mucous membrane is entirely obliterated, whose muscular layers are almost all gone, and which is really enclosed by the peritoneum which surrounded the tube; (*c*) the old ectopic pregnancy in the ampulla, containing the skeletal remains of a fetus which was likely eight weeks old at the time of its death. The tube was not ruptured.

The left tube and ovary represent a single mass from old inflammation. The ovary is smelted into the abdominal ostium, and no fimbriæ are visible. Ancient perisalpingitis and ovaritis have left their story in products covering both. The tube encircles the ovary, and its ampulla has three large sacculations—the largest 1x1x$\frac{3}{4}$ inch, the others about one-half and one-third the size. The tubal wall which encloses the sacculations is almost transparent, consisting of nothing but peritoneum. In a few scattered patches one can see a few scattered bundles of muscles. The abdominal end has closed by turning into the tubal lumen the fimbriæ as the peritoneum contracted down. The fimbriæ lay coiled up as perfect as the petals of a rose, still well preserved as far as the mucous membrane goes. A feature is to be observed in this case, and that is, that part of the tube which lies against the ovary has its mucous membrane intact and normal appearing, while the free portion of the tube is so dilated and stretched that the mucous membrane is stretched out of existence. It simply means that the fluid in the tube expanded the tubal wall in the direction of least resistance, which was away from the solid ovary. The lumen presents the most irregular cavity. The isthmus has at its abdominal end a cavity ($\frac{1}{2}$x$\frac{1}{2}$x$\frac{1}{2}$ inch), circular as a sphere; it no doubt totally obstructed the tube, as at this cavity the ampullar dilatation ceases. This little cavity is filled with cheesy material of a reddish-brown color. It is an old cavity and might be considered a hematosalpinx or possibly an old ectopic pregnancy. From this cavity to the uterus the tubal isthmus is patent, its mucous membrane is normal, but the tubal wall of the isthmus is thickened. The con-

ruptured the tubal wall in that portion which is not covered by peritoneum. I would venture that this was an old ectopic pregnancy. I forgot to state that the whole ampullar end of the left tube was full of pus; it held perhaps three drachms. It was a pyosalpinx.

The left ovary is about normal in size (1x1x½ inch). It is, however, a rare specimen, as it is calcified. It lies in one single piece of hard, irregular, crusty calcification—a mass (¾x½x½ inch). In the centre of this spongy, hard calcification is a cavity containing a milky, cheesy fluid not unlike pus. The ovary has some few cystically degenerated Graafian follicles. I would consider that the calcification came from a single membrana granulosa, which secreted the calcium salts in all directions from its spherical surface, and that the cheesy matter found in the centre is only what is almost always found in degenerated Graafian follicles. The cheesy matter is the product of the granular epithelium composing the membrana granulosa (*e.g.*, the hen's oviduct secretes calcium salts to form the egg shell). Other small particles of lime or calcium salts were found scattered over the ovary.

I have examined several ovaries containing deposits of calcium salts. Formerly writers designated such hard concretions in the ovary as bone or cartilage. But the deposit of calcium salt in the human ovary is only a sample of similar deposits in other animals. I am convinced that the membrana granulosa is the origin of the calcium salts. I have seen it many times, and careful examination traces it to the cavity of the membrana granulosa, and also the shape of the deposit shows it to be circular. The epithelium of the membrana granulosa is glandular and possesses capacity to secrete. The single oviduct of birds contains similar glandular epithelium, which secretes various kinds of salts to form an egg shell. What form of degeneration takes place in the glandular epithelium of the membrana granulosa to induce it to secrete calcium salts remains to be proved. It must be a reversion to some old function of early animal life—atavism.

Respectfully, F. Byron Robinson.

Chicago, Ill., June 21st, 1893.

From the history of this case, the details of which have been



carefully noted, we have good grounds to assume that her first attack of peritonitis was due to a ruptured tubal pregnancy. Whether the second attack was caused by ectopic gestation or by other tubal hemorrhage we are not in a position to know. The pathologist found skeletal remnants of a fetus in the right tube, but no evidence of former rupture. He found traces of hematosalpinx (extra-uterine pregnancy) with a cicatrix in the left tube, corresponding to the uncovered surface in contact with the broad ligament. Without engaging in conjecture, the interesting clinical feature in the case is the fact that the patient survived one or two early ruptured tubal pregnancies, and, without harm, carried their unabsorbed remnants within her pelvis for a period of probably eighteen, or positively not less than six, years.

The calcified ovary is of special interest to the pathologist, as it is a condition not often found. In the literature at my disposition I have found meagre allusion to the condition only in Tait on "Diseases of Women," Wood's edition, 1879, page 150, in which "cretification" of the ovary is referred to as of occasional occurrence.

After the completion of this report an excellent, exhaustive paper and bibliography on "Calcified Tumors of the Ovary" was published by Dr. J. Whitridge Williams in the July number of THE AMERICAN JOURNAL OF OBSTETRICS, to which the writer would refer those particularly interested.

722 WOODLAND AVENUE.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS AND GYNECOLOGY.

Stated Meeting, October 26th, 1893.

H. J. BOLDT, M.D., *in the Chair.*

DR. J. CLIFTON EDGAR presented a

COMBINED CRANIOCLAST, EMBRYOTOME, AND CEPHALOTRIBE

which he had brought from Europe, where it had become very popular. He was unable to speak of its value from personal experience.

THE TOXEMIA OF PREGNANCY: ITS DIAGNOSIS AND TREATMENT.

Dr. Edward P. Davis, of Philadelphia, read a paper with this title. By the term toxemia of pregnancy was meant a condition occurring in the pregnant woman in which toxic material was present in the body in excess. There could be, of course, no nutrition without the production of waste, and, when the dual existence in the body of the pregnant female was considered, it was not strange that an additional quantity of waste products was present. The excretion of this material was effected largely through the agency of the kidneys, and hence the attention of physicians was first attracted by those cases where kidney failure was the first and prominent symptom; but as our knowledge of the pathology of the cases increased we saw that the kidneys were but partially at fault, and we had to look further for the nature of the condition.

The method of examining the urine was passed over. The amount was important. The value of microscopical examination could hardly be overestimated. The facts of special importance in these cases were the urea and serum albumin. Where the urea fell below 1.5 they had stimulated the patient's excretory organs with advantage. In fifty-four cases the average per cent of urea in the pregnant and parturient woman was found to be 1.8. It was noticed that in the majority of cases its amount increased after delivery. Marked diminution occurred only in cases having or being threatened with eclampsia or manifest symptoms of toxemia. They had not regarded the presence or absence of serum albumin as indicating toxemia, yet the occurrence of albuminuria was significant. But where microscopical examination failed to show pathological elements, the presence of albumin had not been regarded as important. In one-half the patients sugar was present in the urine at irregular intervals. The presence of glucose or lactose had had no direct relation, as far as they had observed, to the toxic condition of the patient. Lactose was frequently more abundant as milk became established.

Of the fifty cases which formed the basis of the paper, fully one-third of them, at some time during their presence in the maternity, developed symptoms of toxemia and required eliminative treatment. Illustrative cases were read. The treatment of the toxemia of pregnancy must be directed to excretion by five organs: kidney, liver, intestine, skin, and lung. The termination of pregnancy might be necessary. Milk, as a rule, was the best food, but, if necessary, give other food to keep up the strength. Give pure water, but not in excess, as it was possible to seriously embarrass the kidneys by a sudden increase of the fluid taken. The liver took an important part, and experience had shown the advantage of occasional use of calomel and soda followed by a purgative which would produce free and

liquid stools. Potassium salts were to be avoided. Colocynth was valuable. Cause the skin to act by baths. Wear light woollen next the skin. The hot wet sheet might be useful in addition to the bath. Gentle massage, avoiding the abdomen. The importance of fresh air in abundance had sometimes been overlooked. Especial attention was called to the general condition of the patient's nervous system in the diagnosis of toxemia. He was opposed to the use of sedatives and narcotics. The nervous state was to be improved by aiding elimination. At labor, if an anesthetic was necessary, he preferred chloroform. Recent literature contained abundant evidence in favor of terminating labor by dilating the uterus and extracting the fetus. Avoid the use of drugs which depressed the system.

Dr. William T. Lusk approved of the treatment recommended in the valuable paper. He supposed, however, that many of the symptoms which had been described in the toxemia of pregnancy belonged to the non-pregnant state as well as to the pregnant, and that the treatment recommended, except the induction of labor, would be beneficial in the former as well as in the latter class of cases. He was very glad to hear the author come out in favor of prompt measures where there was threatened eclampsia—cases in which, according to his experience, the kidneys were likely to be involved. There was a time when he had probably stood alone in New York in favor of induction of labor, and he had been led to take this stand because before that he had sat by the bedside and watched the patient die in spite of other forms of treatment. He wished we might have some positive evidence as to what was the cause of the symptoms. Theories had been advanced, but had been abandoned with increasing pathological knowledge. The minor forms mentioned in the paper had not come under his personal observation.

Dr. Von Ramdohr discussed theories of causation. The objection to theories based on contraction of the cerebral arterioles, to hydremia, and to suppression of urine was that these conditions often existed without eclampsia. Clinically we knew that the increased placental area where there were twins or triplets, and the first pregnancy, constituted conditions in which eclampsia was more likely to occur. Then, where there was accidental death of the fetus, even without expulsion, and after induced labor, the convulsions were likely to cease. These facts pointed to increased toxemia, due in some way to the pregnant state, as the cause of the eclampsia. He approved of effecting delivery quickly, and would resort to Dührssen's incisions for this purpose. Benefit was also derived from it in the abstraction of a certain amount of blood.

Dr. Egbert H. Grandin said he had seen but few of the forms of toxemia of pregnancy described in the paper, but he was now of the opinion that it was because he had overlooked

them. In several deaths which he recalled it was probable that the cause, which had not then been determined, was an obscure form of toxemia. The paper had been especially instructive in calling attention to the need of more careful examination of the urine during the pregnant state. We should not rest satisfied with simply determining the presence or absence of albumin. When obstetrics should become a specialty, as it should, he would be led to examine for the amount of urea and other agents and symptoms pointing to toxemia. The paper further impressed the need of attention paid to the liver and other organs as well as to the kidneys.

Dr. Grandin had been especially interested in the countenance which had been given in the paper and during the discussion to emptying the uterus. Some time ago he had ventured to resuscitate accouchement forcé in the presence of eclampsia, actual or threatened, as the best and quickest means of saving mother and child.

Dr. J. C. Edgar thought it important to remember that eclampsia might occur in a woman whose urine was seemingly normal. He referred to two cases seen by him last spring, and in one the pathologist was unable to say that there was organic change in the kidneys at autopsy. The other patient had convulsion after convulsion, and died in apparent uremic coma, yet repeated examination of the urine failed to show albumin. With regard to treatment, he believed in immediately emptying the uterus. He saw no reason why the woman should not be placed under the influence of chloroform and accouchement forcé be performed.

Dr. R. A. Murray had seen two fatal cases of toxemia of pregnancy in which there was no albumin, and urea was present in normal quantity. In one instance there were no convulsions, but the patient suffered from headache, delirium, and melancholia, but the husband refused to have labor induced. The patient aborted twelve days afterward, and died after three days without evidence of sepsis. Nothing was discovered wrong with the kidneys. He believed, however, that uremia was the form of poisoning in the majority of the cases of toxemia occurring during the course of pregnancy. It was important to recognize that fact, because in no disease was treatment more successful when based upon the theory of the causation. In mild cases we might control the condition by diet, etc., but he was opposed to temporizing in severe cases. Give chloroform to control the spasms, and empty the uterus. Hydrate of chloral should not be used because of its depressing effect upon the heart. He had reason to believe it had caused death in some cases. In plethoric patients he might try blood-letting. The loss of some blood after delivery was a benefit. Dilatation of the cervix could always be effected by the finger.

Dr. Mary Putnam Jacobi had been struck by the author's allusion to medicines and foods containing much potassa, forbidding their use. The only work in which she had seen this recommendation was the excellent one of Bouchard on auto-intoxication. She thought this work would revolutionize our views regarding the part taken by the kidneys. In it the question of the toxicity of the urine and other excretions had received much consideration. Four ways were mentioned in which auto-infection took place: 1. The poisons generated directly from the food, especially from the potassa. 2. The absorption of putrefaction products by the intestine. 3. Poisons in the bile, which might be as great at least as those in the urine. 4. Toxines which were being constantly produced by the cells of the organism. The ordinary metabolic products of the fetus were being added to those of the mother, which added to her danger, and when the fetus died or labor was induced this important source of toxemia was removed, which would account for the improvement which usually followed labor. Dr. Jacobi recited a case.

Dr. Edward A. Ayers mentioned certain facts which might have some bearing upon the etiology and treatment. Primiparæ were much more likely to have eclampsia, a fact which one would least expect when he considered that they were younger and healthier, as a rule, than multiparæ. In seeking an explanation, it was observed that during the first pregnancy the abdominal walls were more tense, which tended to drive the uterine body further down into the pelvis, thus interfering with circulation. Again, most cases of eclampsia were in head presentations, which further interfered with the pelvic circulation. Acting on this theory of the causation, he had in two cases practised external version, with the result of diminishing the albuminuria and edema in marked degree. In two the albuminuria was diminished by keeping the patient on the side and causing elimination from the bowels. He had also used nitroglycerin in six or seven cases with such satisfaction that he wished to see it tried further. It did not depress the heart, it increased the flow of urine and sweat, and its use had been followed by a reduction of the amount of albumin and urinary casts. He gave it in one-hundredth grain doses every three hours while needed.

Dr. Van Santvoord referred to a paper which he had read before the Academy of Medicine, and wished now to call attention to the after-history of these cases, which could be best studied by the general practitioner. Many patients did not entirely recover after labor, but went on to have developed chronic nephritis, of which he had had proof in two cases which he had been able to study. It seemed to him the metabolism, or whatever process brought about the albuminuria, was not essentially different in the albuminuria or toxemia of pregnancy from what

Dr. W. R. Pryor thought the treatment of toxemia of pregnancy should be the same as that of the non-pregnant state, namely, to establish a balance between tissue waste and tissue elimination, only that in pregnancy the further step of emptying the uterus was to be carried out.

Dr. Lusk hoped it would not be understood that he advocated immediate resort to accouchement forcé in emptying the uterus.

Dr. Davis closed the discussion. He held that the man was a better obstetrician who avoided eclampsia than he who waited and effected delivery by a difficult operation. He had been indebted to Bouchard's work in his study of these cases. He did not believe urea was the cause of the convulsions, but named it as an index of the excretory functions of the kidneys, and not as the poison material itself. He agreed with Dr. Van Santvoord that these cases often passed into nephritis. Blood-letting was valuable for no other condition than an apoplectic one.

TRANSACTIONS OF THE OBSTETRICAL AND GYNECOLOGICAL SOCIETY OF WASHINGTON.

Stated Meeting, April 1st, 1892.

The President pro tem., A. F. A. King, M.D., *in the Chair.*

Dr. William M. Sprigg read an essay on

DRAINAGE IN THE TREATMENT OF ACUTE SEPTIC ENDOMETRITIS.

The several varieties of metritis are designated: 1. By the character of the inflammation, whether acute or chronic. 2. According to location, cervical or corporeal. 3. By the causes which give rise to them, as puerperal, gonorrheal, etc.

We are called upon to treat acute endometritis most frequently after abortions, miscarriages, and labors. The rapidity of the inflammation and destruction is much greater in the recently emptied organ than when the same condition exists in the "non-pregnant" uterus, and fortunately is more amenable to treatment.

This condition when present in the non-pregnant uterus is unquestionably more difficult to combat. We will therefore consider this condition first. The most potent factor in causing acute endometritis in the non-pregnant uterus is gonorrheal infection. Until recently about all that was done was to put the patient to bed, to apply heat—usually poultices—to the

hypogastrium, give vaginal douches, keep the bowels well evacuated, and give anodynes to allay pain. This treatment is rational and good, but I believe we should go further and see that the organ is thoroughly drained. With an inflamed and swollen endometrium, it must necessarily be thrown into folds, if ever so slight, and encroach upon the membrane opposite and partially or completely obliterate the internal os. The penning-up of such secretions, even partially, is dangerous to the patient. If this condition of affairs be correct, that the endometrium is swollen and prolapsed, closing the internal os, then the necessity for drainage is obvious. I have not had the opportunity to apply drainage to the uterus in this condition, but will certainly do so with the next case of the kind that presents itself. It is more difficult to apply drainage to the uterus under these circumstances than to a recently emptied organ. However, in the presence of antiseptic precautions we can with safety apply the drainage and save many patients the possibility of extension of the inflammation to the adjacent parts and appendages of the uterus, which arrange themselves somewhat in this order: salpingitis, ovaritis, peri-ovaritis, and the much-dreaded "pus in the pelvic cavity."

These are conditions that do occur, no matter which of the pathological views we adopt for the extension of the inflammation to the surrounding parts. In applying this treatment to the non-pregnant uterus the vulva and the vagina should be thoroughly cleansed with a bichloride of mercury solution 1 : 2000.

The cervical canal should also be carefully washed with the same solution. If it is found that you cannot with ease introduce a double canula catheter beyond the internal os, the cervical canal and internal os should be dilated and the cavity of the uterus washed out thoroughly with the bichloride of mercury solution 1 : 2000. After the irrigation has been completed the vagina and cervical canal should be dried out and a strip of iodoform gauze carried to the fundus of the uterus. This is best accomplished with a cervical speculum. The gauze should be left long enough to extend a short distance out of the vulva, and a piece of absorbent cotton placed against the vulva to catch the discharges, and held in place by a T-bandage.

The dressings should be removed at the end of twenty-four hours, and a fresh strip of gauze applied as before. The cotton pads should be changed as often as they become soiled. The pain caused by dilating the cervix can be overcome by the use of cocaine.

We now come to the treatment of acute endometritis following abortions or labors. This is a field in which I am sure the advantages of this treatment will be readily appreciated. The preliminary treatment is similar to that described above, and is much more readily carried out, but the treatment of the uterine

cavity is much more radical. Here the uterine cavity is treated with the curette, and all blood clots and remains of any deciduous tissue are carefully separated from the uterine wall and removed, and then the irrigation of the uterine cavity is made. Then the introduction of the iodoform gauze is made as before—except that it is better to loosely fill the uterine cavity—and the cotton pad and T-bandage are applied as before. I have been much pleased with this treatment in the latter class of cases, and where there is any reason to suspect the possibility of supervening septic endometritis I should apply the treatment as a prophylactic measure.

Dr. H. D. Fry thought the treatment resorted to by Dr. Sprigg good. There had been a vast improvement over the old method of treating such cases. We now depend upon local treatment, rather than medicinal which prevailed until a few years ago. The most important point in the treatment is to attack the cause directly—that is, to remove decomposing matter from the uterus, by dilatation if necessary. The os should be dilated, if not relaxed, and dilated enough to remove the débris. The finger is the best to accomplish this, if we can succeed with it; the forceps next, then the curette, and finally the application of iodine or carbolic acid, or both. The douche should always be used and the cavity filled with iodoform gauze. The recovery may be hastened by removing the gauze and irrigating the uterine cavity between its applications. The gauze in the uterus and vagina should be changed frequently. He did not think the gauze should protrude from the vulva, on account of its liability to become soiled. He would commend the paper and the treatment.

The President asked Dr. Sprigg to give the method of dilatation.

Dr. Sprigg replied that in some cases he used Goodell's dilator. He had only done it once under chloroform, and in the multiparous cases forcible dilatation was not necessary.

Stated Meeting, May 6th, 1892.

The Vice-President, H. L. E. Johnson, M.D., *in the Chair.*

Dr. George Wythe Cook read the paper of the evening, entitled

SHOULD MARRIAGE BE RECOMMENDED AS A REMEDY FOR DISEASE IN WOMEN?[1]

Dr. H. L. E. Johnson, in opening the discussion, said he thought that the "prescription of marriage" for a woman was a difficult one to fill, inasmuch as the woman had no privilege of making her own selection. It was true that many diseases were made worse by marriage; but simple obstructive dys-

[1] See original article, p. 831.

menorrhea was not a pathological condition and would be relieved by pregnancy. And some conditions of pelvic inflammation with adhesions were often relieved by pregnancy, the adhesions being softened and absorbed. He thought that an unhealthy uterus should not be taxed by pregnancy and childbirth.

Dr. W. P. Carr said that anteflexion could be cured in no other way than by pregnancy. The first pregnancy, however, was apt to result in abortion. Many hysterical women were benefited by marriage, but he would not advise marriage in all those cases. He related the case of a woman who had violent hysterical seizures, brought on by disappointment in her affections.

Dr. A. F. A. King said it was an exceedingly complicated matter. There were many conditions which should be considered. In a paper which he had written some time before on hysteria, he quoted many authors who related numerous cases that were cured by marriage. He said that he believed that in young women who were normal and surging with passion and were hysterical, if they were married early enough, cures might be effected.

Dr. Geo. Wythe Cook, in closing the discussion, said he thought the matter was grave enough to demand the most serious consideration. He said that while some of the diseases mentioned might not be a bar to marriage, he scarcely thought that any physician would advise a woman to marry, under the circumstances, if he thought his dear friend would be the victimized man. Hence it should not be advised at all.

TRANSACTIONS OF THE PAN-AMERICAN MEDICAL CONGRESS.

HELD AT WASHINGTON, SEPTEMBER 5TH, 6TH, 7TH, AND 8TH, 1893.

SECTION ON GYNECOLOGY AND ABDOMINAL SURGERY.

Second Day, September 6th—Afternoon Session.[1]

The next paper presented was on

CAVERNOUS ANGIOMA OF THE UTERUS REMOVED BY VAGINAL HYSTERECTOMY, WITH SPECIMEN,[2]

by Dr. H. J. Boldt, of New York.

Dr. Boldt, after reading his paper, said that the question of cure after the operation depended upon the disease. If we operate for cancer and the disease does not return in a year or

[1] Concluded from p. 708, November number.
[2] See original article, p. 884.

a year and a half, we may pronounce the case cured. But where patients die six months after an operation it is not necessarily a return of the disease; it may be that the disease was not thoroughly eradicated. Nor does the fact that the broad ligaments may be involved by infiltration imply that such infiltration is of a malignant character; it may be due to perimetritis. Dr. Boldt preferred the ligature to the clamp in nearly every instance, though there are a few cases where clamps are necessary. He condemned silk entirely and said that we have no use for it whatever. He did not think it necessary to say whether we should begin anteriorly or posteriorly, as that point must be decided by each individual case. As we go on with our ligatures the broad ligaments are reached, and these he ligated in sections. Catgut is the material to be used, and there is no danger of this slipping if they be superimposed and drawn tight before tying. The stumps (already secured in the vagina) are grasped by bullet forceps, and an assistant pulls on the ends of the stumps while the operator takes another sweep all around the stumps on either side; the vagina is then closed completely. There is no danger of secondary complications after an operation by this method, and the woman need remain in bed but a few days (about ten days on an average). His rule is to have his patients sit up on the third or fourth day. Some surgeons think they must use drainage because the pad is wet with serum in those cases where it is used, but this is not a sufficient indication for its use. To recapitulate: The vagina should invariably be closed; in suitable cases the stumps of the broad ligaments are to be treated extraperitoneally; use only catgut in every case.

Dr. Boldt, in closing the debate on his paper, said that Dr. Montgomery had contradicted himself in his own paper in regard to hemorrhage. Dr. Baldy had called attention to an unquestionable danger in the use of the clamp—viz., the danger of tissue slipping from the clamp. With the ligature operation there is no danger of hemorrhage. He thought that in liberating one side of the uterus and pulling down the uterus, as advocated by Dr. Kelly, there is danger of the top of the broad ligament on the other side tearing and bleeding. In ordinary cases, he repeated, there is no use for drainage if we close everything in a surgical way.

Dr. R. B. Maury, of Memphis, Tenn., read the next paper, entitled

THE PRESENT STATUS OF OUR KNOWLEDGE OF THE PATHOLOGY OF PELVIC INFLAMMATION, WITH SPECIAL REFERENCE TO THE TREATMENT OF PELVIC ABSCESS.[1]

Dr. H. J. Boldt, of New York, said that this was the best paper on the pathology of this very common and important af-

[1] See original article, p. 737.

fection which he had ever heard, and that it would be boldness for him to add another word to the able paper of Dr. Maury.

Dr. A. C. Bernays, of St. Louis, said that the operation of Ségond seemed to have been very imperfectly translated and very badly treated in the American medical press. Ségond's operation aims to do the same thing that celiotomy accomplishes, but the uterus is not always removed entirely, but only so much of it as may be necessary in order to reach the infected and suppurating pelvic tissues. The statistics of abdominal section for the relief of pyosalpinx show it to be such a grave operation that he claimed that many operators could operate just as well, or better and more radically, by the vaginal method. This method aims to drain such pus sacs as cannot be removed. He had done this operation but three times, but in all cases the result was good. He had operated in the abdominal cavity about 1,055 times, and he thought this gave him somewhat of a right to have an opinion as to the relative merits of the Ségond operation and abdominal section, and it was his belief that the Ségond method would supersede the abdominal operation in many instances.

Dr. J. H. Carstens, of Detroit, Mich., spoke of the difficulty of getting out pus tubes, and he could not understand how any one could operate through the vagina and take out one-half or one-quarter of the uterus, as the case might be. The tubes are sometimes divided into several sections, like the links of a sausage, and one section may be cleaned out, but the patient will suffer from the other sections in after-years. He did not agree with Dr. Maury's statement that there are some cases where you cannot take out pus tubes. With the patient in the Trendelenburg position there is not a tube, he thought, which could not be got out by a good operator. When we can get such good results by abdominal section there is no use getting up complicated operations like Ségond's: it is blind surgery and not good practice.

Dr. Joseph Taber Johnson, of Washington, D. C., agreed so entirely with everything Dr. Maury had said as to the pathology of pelvic inflammations that anything he might add would be but a repetition of the doctor's views. He had never done Ségond's operation, but he was inclined to indorse Dr. Carstens' criticism of it. He believed that the great majority of the cases of pelvic inflammation, probably ninety-eight per cent, originate as salpingitis or endometritis. His experience in the treatment of this condition was all gained through the abdominal route. He had seen a number of cases where the pus was attacked through the vagina, but he had never seen a complete cure by this method. It nearly always happens that some pockets are not emptied and the woman continues to suffer, so that often patients have had to wear a drainage tube.

Dr. Charles P. Noble, of Philadelphia, Pa., was glad to

hear Dr. Maury affirm that while pus is generally found in the Fallopian tubes, the ovaries, or within the peritoneum, we do sometimes find it in the broad ligaments. He had met with six cases in which the pelvis was involved while the tubes were not, but he had never seen such cases except in the puerperal state. In Philadelphia it is rank heresy to claim that you can have pus in the broad ligaments; and he had been told that even though pus was evacuated, still it was a mistake, that they were cases of suppurating tumor developed in the broad ligament. He was glad, too, to hear Dr. Maury take the position that in certain cases a patient may be too sick to "clean out the pelvis," to do an ideal operation. He had always aimed at ideal surgery, but from some unfortunate experience he had learned, as advised by Dr. Maury, to incise the abscess cavity, irrigate it and pack with gauze, instead of attempting enucleation in broken-down subjects.

Dr. Maury, in closing the discussion, said (replying to Dr. Carstens) he agreed that it was always possible to get out pus tubes. Replying to Dr. Bernays, he said that he had never done the Ségond operation, but he had read an account of it in the original French, and he was forced to believe that it is entirely inadequate to deal with a large number of inflammatory cases.

Third Day, September 7th—Morning Session.

The first paper read was on the

RELATIONS OF URINARY CONDITIONS TO GYNECOLOGICAL SURGERY,[1]

by Dr. Charles P. Noble, of Philadelphia, Pa.

Dr. A. Lapthorn Smith, of Montreal, Canada, thought Dr. Noble's paper a very important one. Urinary conditions following operations are a source of much worry to surgeons, and every one should know whether the presence of albumin is a contra-indication to an operation. He thought that the removal of a tumor, no matter what kind it might be, would result in a diminution of the quantity of albumin or in its total disappearance. He related a case in which the albumin became very much less after the removal of a pailful of serum from the abdomen, when he was also enabled to discover two large ovarian tumors. He also recalled a case of pregnancy where the albuminuria ceased after labor. He attributed the diminution in the quantity of urine after Dr. Noble's operations to the fact that his patients were deprived of water for several days. He thought a small quantity of water should be allowed, in order to compensate for the loss of serum from the blood vessels. He felt certain, he said, that prolonged administration of ether

[1] See original article, p. 753.

would cause albuminuria by the irritation of the kidneys which it caused, but chloroform has no such effect. He generally uses the A. C. E. mixture, however.

Dr. Joseph Taber Johnson, of Washington, D. C., said he had derived a great deal of comfort from Dr. Noble's paper, because he had frequently been alarmed and worried by the report of his nurses that a patient was passing very little water. Sometimes he had taken quite active steps to make the kidneys secrete more urine, for he could not tell whether the diminished amount of urine was the beginning of total suppression or whether it was only the usual temporary diminution of the secretion. It was not only in laparatomies, he said, that this condition occurred, for he had seen it follow the repair of a lacerated cervix and perineum. In this case the urine had been examined before the operation and was found to contain no albumin; but the urine gradually became suppressed after the operation, and the patient died on the sixth day from uremic coma. He afterward learned from the woman's husband that she had had chronic Bright's disease. He thought that surgeons should not be satisfied with one examination just before operating, but should make several analyses.

Dr. Eugene Boise, of Grand Rapids, Mich., thought that, in this temporary suppression of urine after operations, there were several factors to be taken into account. It was not necessary that there be any chronic kidney lesion; the irritation of the kidneys set up by the ether was sufficient to account for the trouble. So, also, are abdominal operations whereby the blood vessels unload themselves and there is an outpouring of serum into the cavity. These factors, together with shock and profuse perspiration, are sufficiently potent to cause temporary suppression of urine. The best way to treat such cases, he said, is not by the use of drugs, but by the introduction into the bowels of a large quantity of water. The addition of fluid to the system by this means supplies the necessary amount of fluid to the tissues and equalizes the loss of serum from the blood vessels.

Dr. J. H. Carstens, of Detroit, Mich., indorsed Dr. Noble's statements. He had been unfortunate in losing two patients out of one hundred operations, by uremic poisoning, during the past year. He had thought that ether had something to do with his fatal cases in former years, but he had since used chloroform with no better results, and he did not know even yet whether the ether or chloroform really had anything to do with it. He took a different view of the pathology of the condition, and considered it as dependent on poisoning of the solar plexus. When he had a patient with symptoms of uremic poisoning it was not his practice to give drugs to act on a kidney already irritated, but to make use of steam baths, and supply the necessary amount of liquid to the system by giving the patients water to drink and by injecting water into the bowel. In addition they



were given hypodermic injections of strychnine and atropia in order to keep up the strength.

Dr. I. S. Stone, of Washington, D. C., considered Dr. Noble's paper of more importance than any which had been read. He had lately lost a patient from suppression of urine, and naturally thought that her death was due to the ether. Before the operation her urine had been examined: there was no pus or albumin, and the quantity was normal. At the autopsy the kidneys were found congested and the pelves contained pus. This called to mind, he said, the impossibility of ascertaining the condition of the kidneys in many cases. We are unable to tell in very many cases whether the anesthetic produced the albuminuria or whether Bright's disease was present. In desperate cases, however, he would operate, even though he found albumin in the urine. He had used ether and chloroform indifferently, but the result had been about the same with both. In some cases he thought the result might be due to what Dr. Loomis, of New York, called general fibrosis. Shock enters into nearly every operation of this character, and might be the cause of the albuminuria in some cases.

Dr. Noble, in closing the debate, said he was pleased that the paper had elicited such a good discussion. He considered the point made by Dr. Lapthorn Smith in regard to the administration of water both by the mouth and by the rectum a most excellent one. Dr. Kelly's patients, he stated, passed more water than his, but he had found upon inquiry that they were given more water than his. He had purposely omitted in his paper any discussion on the relative merits of chloroform and ether, but he had been brought up in a school where it had been taught that ether was irritating to the kidneys and that chloroform was not. But Dr. Carstens had given nothing but chloroform in the last year, yet he had had two deaths from suppression of urine. That ether will produce albuminuria is undoubted, but he had found from reading recent discussions, especially in European societies, that chloroform will produce it even more frequently than ether. So good a chemist as Lawrence Wolff, of Philadelphia, denied that ether was eliminated by the kidneys. He was still on the fence in regard to the use of anesthetics, but was inclined to use ether. He thought that the diagnosis between beginning suppression and merely scanty urine might be best made by the general condition of the patient, but the diagnosis between septicemia and suppression was more difficult. He agreed with the statements made that sometimes it is impossible to tell whether the patient has chronic Bright's disease by examining the urine. Referring to Dr. Stone's question as to whether arteriosclerosis could be considered a causative factor, he stated that that was a condition antedating Bright's disease, and could be best diagnosed by examining the heart and pulse rather than the kidneys. He believed that suppression of urine

was due to refrigeration of the body of the patient and to other unsuitable conditions rather than to the anesthetic. He considered the plan of flushing out the bowel a most excellent one, but thought the fluid could be introduced through a stomach tube as advantageously as through a rectal tube.

Dr. A. Vander Veer, of Albany, N. Y., then read a paper entitled

DRAINAGE OF OVARIAN CYSTS WHERE THE ADHESIONS ARE SUCH THAT IT IS IMPOSSIBLE TO REMOVE THE SAC,

in which he said our zeal to rid the patient entirely of her cyst might lead us to extend the operation at the cost of life. In bad cases it was better to shorten the operation and drain some portion of the cyst wall by glass tubes or gauze. Adhesions in the pelvis may be broken with little subsequent shock, while those to the colon and abdominal viscera are much more serious to manage.

Dr. Andrew F. Currier, of New York, considered that the paper of Dr. Vander Veer, like the one which preceded it, admonished us to examine our cases more carefully before operating. He thought success in operating likely to create a false feeling of confidence. If this Congress, he said, did nothing more than charge us to look to our cases with more care and thoroughness before operating, it would have accomplished much. The subject under discussion presented two aspects: one, where it is necessary to remove the adhesions under any and all circumstances; the other, where they may be left undisturbed. But adhesions which interfered with the normal peristaltic action of the intestines should be broken up at any cost. In considering the advisability of an operation upon a woman with a mass of adhesions, the probable chance which the patient has of surviving the operation should chiefly influence us. The suggestion made by Dr. Cushing, that in many cases we cannot tell whether a patient is septic or not, must be weighed carefully; but we should endeavor to acquire a knowledge of the condition of our patients, and we must be governed almost entirely by this condition in deciding the question of an operation, *pro* or *con*.

Dr. Charles P. Noble, of Philadelphia, Pa., agreed with the author of the paper that it is sometimes wise to stop an operation instead of finishing it. Schröder and Olshausen taught that everything should be removed, but Dr. Noble did not assent to this doctrine. He had recently operated for the removal of a tumor, but at the last moment he decided not to remove it, and he believed the patient would have died had he persisted in taking it out. He described a case in which he had found the tumor adhering to, or rather incorporated with, everything from the bottom of the pelvis to the epigastrium, and he did not want

to interfere with it. He had operated on another patient for papillary cyst with adhesions. She recovered from the operation, but died some weeks afterward. Adhesions to the bowel and mesentery are the most troublesome, but when the adhesions are in the pelvis it is always possible to get them out. Malignant cases, and cases where the intestines are pushed up by the tumor and are around the diaphragm, had better not be interfered with. He had never seen a case of the latter character, but believed they all died.

Dr. A. Lapthorn Smith, of Montreal, Canada, gave the result of the use of the cautery and iron for the checking of hemorrhage from the intestines. In one case he had used the Paquelin cautery, and the hemorrhage had been promptly controlled. Some time afterward, in making a second abdominal section, he had a chance to examine the point where he had applied the cautery, and found that dense adhesions had formed all about it, and he thought the profession should cease using such measures. He inveighed against long operations, and said that any surgeon who continued an operation for four hours subjected his patient to a risk which was little short of criminal. He thought that if an operation could not be done in one hour, or a little over, it should be stopped then anyhow.

Dr. I. S. Stone, of Washington, D. C., related the particulars of a case similar to Dr. Vander Veer's, which had recently occurred in Washington. When the abdomen was opened everything was found to be in one conglomerate mass, with the intestines growing all about a tumor. The operation was postponed and the woman got well. He thought it safer to accept the dictum: "Do not operate four hours."

Dr. Vander Veer, in closing the debate, emphasized the point made by Dr. Currier, viz., that adhesions to the small intestines should be loosened in every case. He said that when pus was found in the pelvis we should go as far toward complete removal of it as the condition of the patient would warrant. He thought it wonderful how patients with papillomatous growths would get well after rough handling. He thanked Dr. Smith for the recital of his experience in the use of the cautery. He had never used the cautery, as he considered it dangerous, and he thought the use of iron was but little less so.

Dr. Eugene Boise, of Grand Rapids, Mich., then read a paper on

THE AFTER-TREATMENT OF CELIOTOMY CASES, WITH SPECIAL REFERENCE TO SHOCK AND SEPSIS.

He said there were three post-operative conditions which call for prompt, intelligent action: secondary hemorrhage, shock, and septic peritonitis. Shock is some form of paresis of the sympathetic nervous system. It is primarily hyperirritation of

the entire sympathetic system. The primary condition in shock is severe stimulation of the entire sympathetic system, with consequent cardiac and arterial spasm. The second stage of shock may be a so-called paresis by reason of the exhaustion of the heart. The remedies, therefore, would be, for the first stage, free hypodermics of codeine, nitrite of amyl, and nitroglycerin, with copious injections of hot water into the colon; for the second stage, strychnia, digitalis, and cardiac stimulants, with, if necessary, intravenous transfusion of hot saline solution.

All operators have an instinctive feeling that prevention of sepsis prevents peritonitis, and, therefore, their efforts are directed to prevent the entrance of septic material into the cavity; or, if the material removed is of a septic nature, to cleanse the cavity as thoroughly as possible and to remove the fluid which would otherwise invite infection. The two post-operative measures relied on for this purpose are drainage and free catharsis. Drainage may be accomplished by tube or gauze, and if used must be thorough.

In the production of catharsis several factors are to be kept in mind. First, after every celiotomy there is a flow of serum from the blood vessels into the peritoneal cavity, thus depleting the vessels.

Second, during the first few hours after a celiotomy of any considerable severity there is more or less paroxysmal abdominal pain, sometimes very severe. This is caused by irregular and spasmodic peristalsis, the muscular coat of the intestines contracting unequally, and, it may be, tonically obstructing the bowels.

Third, by reason of the withholding of fluids, the intraperitoneal serous effusion, and, it may be, profuse perspiration, the blood vessels of the intestines are greatly depleted. For the easy production of catharsis the current should have ceased to flow from the blood vessels toward the peritoneal cavity.

The spasmodic contraction of the intestines should have been overcome and the blood vessels should have been replenished. The serous effusion will cease after a few hours. The spasmodic contraction of the intestinal muscles should be overcome by a hypodermic injection of a free dose of codeine, and the blood vessels should be filled by means of hot water thrown into the colon. Then catharsis may be produced with comparative ease.

Dr. E. W. Cushing, of Boston, Mass., said that the zeal for novelties was getting so rampant that the profession was getting ahead with new theories faster than they could be put into practice. But here was a practical question which had been in existence since the time that Cain killed Abel. He considered the suggestions of Dr. Boise very valuable, especially those regarding the injection of hot water into the intestines and the use of opium to combat shock. He had long pondered over the question of obstruction of the bowels after operation, but he was no

nearer a solution of the problem than he was at first. He had seen apparently simple cases followed by obstruction of the bowels, sepsis, and death, while extremely difficult and complicated cases had got well without any bad symptoms. Why that should be so he did not know.

Dr. Tuck, of Cambridge, Mass., said that in considering the subject of shock and peritonitis we were considering practical questions, leaving theory out of the question. In preparing a patient for an operation an important thing was the care of the intestines. Obstruction of the bowels was often due to paralysis of the intestines following celiotomy. In order to overcome flatus and tympanites we give salts, but most operators do not go far enough in that direction. We should make it a habit to thoroughly clean out the bowel before beginning an operation. We may give a dose of salts every hour, but we must do more than that to make the intestinal tract aseptic. The best thing is to give, on the first day, calomel to act on the upper portion of the bowel, and follow this up with salts.

Sepsis may be due to a cardiac thrombus, and to avoid this accident we throw in a stimulating material by transfusion. When operating he always has a bag, filled with saline transfusion material combined with a stimulant, near at hand, and when necessary this may be thrown into the system through a needle inserted in the abdominal wall. It is an easy matter to transfuse enough of this solution to form a tumor about the size of an orange, which will counteract all tendency to shock.

Dr. Charles P. Noble, of Philadelphia, Pa., said he had taken a great deal of interest in the paper of Dr. Boise, because the subject had been presented in a way differing from that in which he had previously considered it. He had always regarded it as a state of depression, whereas Dr. Boise considered it as a state of depression secondary to over-stimulation. The best way to treat shock was to prevent it, and the best way to prevent it during an operation was to have the temperature of the operating room between 75° and 85°, to have good warm blankets wrapped around the legs and body of the patient, and the avoidance of wet towels around the patient which helped to refrigerate the body through evaporation. For the *treatment* of shock he had used amyl nitrite and nitroglycerin. He had also used strychnine in large doses, and the more he used it the more he liked it. It added to the capacity of the heart to do its work, he said, and stimulated the nervous system, thereby militating against Dr. Boise's position. He never used less than one-fifteenth of a grain, repeated in three or four hours, and in bad cases he used one-fifth of a grain. Artificial heat and keeping the patient dry were procedures practised by all operators. He had never resorted to the practice of putting water under the skin, but he intended doing so, and was glad to hear such favorable reports of the method.

Dr. Robert T. Morris, of New York, said that it had been found by experiment that the use of chemical solutions or common water in the abdominal cavity would destroy the serosa. The lymphatics opening into the serosa were temporarily closed by the use of common water or chemical antiseptics. Normal saline solution is the only thing that can be used in the abdominal cavity with safety, but the profession was very slow to realize that point.

Dr. J. H. Carstens, of Detroit, Mich., said there was one thing which had not been mentioned by Dr. Boise or any of the previous speakers, and that was that in paralysis of the intestines, when the bowels cannot be made to move, the administration of fifteen or twenty drops of turpentine every hour would do much good.

Third Day, September 7th—Afternoon Session.

The first paper read at the afternoon session was entitled

AN INQUIRY INTO THE ETIOLOGY OF MENTAL DISTURBANCES FOLLOWING OPERATIONS UPON THE PELVIC ORGANS,

by George H. Rohé, M.D., of Catonsville, Md.

The author claimed that an analysis of the available evidence showed that a large proportion, possibly the majority, of cases of mental disturbance following operations upon the pelvic organs is due to the same causes that produce insanity subsequent to surgical operations generally. These causes are shock, sepsis, or intoxication from drugs or antiseptics used during or after the operation. In a certain proportion of cases of insanity following operations upon the pelvic organs in women, the mental disturbance is due to the artificial induction of the menopause. In a minority of cases it is due to the shock of operation in one hereditarily predisposed to insanity.

Dr. Andrew F. Currier, of New York, stated that Dr. Thomas had read a paper on the mental influences exercised by abdominal operations some years ago, and that his conclusions had been that there was very little connection between the two, that they did not stand in the relation of cause and effect. A year later Dr. Baldy had read a paper on the same subject, and his conclusions, derived from a large number of cases, were entirely at variance with Dr. Thomas'. Those two papers, together with one read by Dr. Rohé last year, were very suggestive, and since then Dr. Currier had seen three cases illustrating two forms of insanity—mania and melancholia. The first was a case of mania following twenty-four hours after a Hegar's operation, and lasting about forty-eight hours. The second case was a member of his own family, on whom he operated for fibroid, simply removing the tubes and ovaries. The operation

was quickly done, and the patient was put to bed in good condition. She had been vomiting almost constantly for twenty-four hours prior to the operation, and the thought of the coming ordeal had been preying on her mind for some time. Twenty-four hours after the operation she became melancholy, and died on the sixth day. The element of sepsis was eliminated from the case, and neither could the rapid production of the menopause have been the cause of the insanity, the doctor thought. The third case was the wife of a physician in New York, on whom he had recently operated. She had had a long and difficult labor, and Dr. Currier was called upon to perform several plastic operations, made necessary by the injury to the soft parts during the labor. She was predisposed to insanity, and about a week after the operation symptoms of melancholia appeared and she became helpless, requiring constant watching by her nurses, as she had suicidal tendencies. Dr. T. A. Emmet was consulted, and replied in a letter: "You know as well as I that in some patients operations on the genital organs are always followed by insanity. Time is usually the cure." Dr. Currier expressed the hope that such a termination might result in the case of his last patient, but this, and the other cases narrated, had profoundly impressed him with the serious results upon the mind which might attend gynecological operations.

Dr. Joseph Price, of Philadelphia, Pa., thought the profession was too prone to mix up coincidence with cause. He had repeatedly operated on insane women, and had removed five women from one asylum and two from another. Out of the eighty-six cases of ectopic pregnancy on which he had operated, not one was mentally sound. A few years ago a prominent Southern physician had visited him and incidentally remarked that Dr. —— had removed an extra-uterine sac from his wife. Dr. Price invited him to assist him in a similar operation, and, after removing the specimen, had placed it in a basin in order that he might see it. He had then asked the doctor and the husband of the patient about the mental condition of their wives, and was told by the latter that his wife had not spoken to him for several days—her mind was not right. It was not worth while, said Dr. Price, to say anything about criticisms that might be offered; Dr. Rohé could just go on with his work, paying no attention to newspaper articles or to the carping of ignorant critics. He stated that at least ten per cent of the women confined in asylums could be taken out by suitable gynecological operations. Speaking of the importance of the sacral plexus of nerves being impinged upon by a retrodisplaced uterus, he related the case of a young lady who had consulted him for this condition. She was afraid she might do some injury in one of her paroxysms, and she asked for some relief. The uterus was replaced and retained by a pessary, and the woman recovered, and she took the trouble some time afterward to enter

Price for what he had done for her. "You may say that these women are not insane," said Dr. Price, "but you would think otherwise if they were your own mothers, sisters, or wives." One of his patients was a German woman whose cervix had been closed by an operation and who was morose and melancholy. He removed pus tubes and ovarian abscesses, when her mental horizon began to clear up and she commenced to take an interest in all about her. He thought Dr. Currier's first case was operated on too soon and she had had too many attendants. If six or seven doctors are attending an ill doctor he invariably dies, but if he has only one or two in attendance he usually gets well.

Returning to the question of mania in fibroid disease, he said he was satisfied that few women with fibroids were perfectly rational. Such cases should be treated by early hysterectomy.

Speaking of the sequelæ of operations, he had seventeen patients in bed with legs as small as his wrist. They were all very anemic, and the operations were so complicated that it was necessary to drain sixteen out of the seventeen. The trouble is that such patients are hurried home from the hospital too soon, and they have insufficient food and clothing, cruel husbands, or friends who do not understand their condition. Farmers' wives head the list in asylums. It is a very common thing to attribute insanity to the operation, but we might just as well attribute it to the burning of the last baking of bread, or upsetting a pail of milk, or the chickens dying of gapes, since they bake every week, and go insane every week.

Dr. Rohé, in closing the debate, said he thought the first case mentioned by Dr. Currier should be attributed to shock. It was a fact that the shock of an operation in a person predisposed to insanity might produce an outbreak of delirium which might pass away rapidly. Such patients are not insane at all; he protested against calling such slight and transitory delirium insanity. The second and third cases reported by Dr. Currier both had histories of insanity, and he thought it just possible that the depression caused by the operation had developed the latent tendency to mental disease. But although there was no evidence of sepsis, he was inclined to think that those cases were due to sepsis. He thought many of the cases mentioned by Dr. Price were clearly cases of septic insanity. Dr. Price had said that profound anemia caused a predisposition to insanity, and that the way to keep such patients from going insane was to feed them well and keep them from anemia; but that matter lay outside of the domain of the abdominal surgeon. If all patients who went to the surgeon were in good physical health, if their blood was in good condition, then he did not believe that mental disturbances would follow operations once in five thousand times.



Dr. I. S. Stone, of Washington, D. C., also read a paper, entitled

REPORT OF ONE HUNDRED OPERATIONS DONE FOR SERIOUS STRUCTURAL DISEASE OF ABDOMINAL AND PELVIC ORGANS OF WOMEN.

A detailed account was given of the diagnoses, treatments, and results of a series of cases that were operated upon only after an examination, and a unanimous approval by the whole staff of the hospital. The series embraced seventeen cases of pelvic abscess, twenty-one cases of tubo-ovarian abscess, and eleven of myoma uteri, and the total mortality was fifteen per cent.

Fourth Day, September 8th—Morning Session.

DISCUSSION OF THE PAPERS OF DRS. PRICE AND STONE.

Dr. A. Lapthorn Smith, of Montreal, Canada, confined his discussion to the subject of the most desirable method of removing the uterus for fibroids. While the tendency of the profession was in favor of total extirpation, he thought that the extraperitoneal treatment of the stump was far safer. It was madness for any but the most skilful surgeon to attempt Baer's operation, or any other requiring total extirpation. He had had only three cases which required operations, the remainder being all treated by electricity. The three operations he had done were by the extraperitoneal treatment of the stump, and they gave no anxiety whatever. While there may be sloughing, it is limited; there is no odor nor rise of temperature, but even if there were it would not necessarily be inferred that the peritoneum would be in danger from it. Martin's mortality by the intraperitoneal method of treating the stump was thirty-eight or thirty-nine per cent. He laid down the rule that the majority of surgeons in this country who have to remove fibroids should do it by the extraperitoneal treatment of the stump. In the hands of men who had done several hundred operations total extirpation was undoubtedly the best, but it would be foolhardy for any one not familiar with the operation to attempt it.

Dr. I. S. Stone, of Washington, D. C., thought it strange that such an eminent surgeon as Dr. Price should advocate the intraperitoneal treatment of the stump in preference to the total-extirpation method. He thought surgery should not remain at a standstill, and he was confident that if Dr. Price would take a few cases and perform total extirpation on them he would be satisfied with it. He would do it as well as he did everything, and he would do it as quickly as amputation with extraperitoneal treatment of the stump.

The next paper read was entitled

DEDUCTIONS FROM MY FIRST ONE HUNDRED AND TEN LAPARATOMIES FOR APPENDICITIS, WITH REPORT OF EXPERIMENTAL INVESTIGATION,

by DR. J. B. MURPHY, of Chicago, Ill. He said that the appendix is usually situated a little below the midpoint from umbilicus to anterior superior spine of the ilium, though it may be found near the kidney to the left of the uterus, or even near the spleen. By far the greater number of cases of retention appendicitis are from impaction of fecal concretion. Thus in forty cases thirty-eight fecal concretions were found in the appendix, and only two foreign bodies, such as grape seeds.

Seventy per cent of autopsies from appendicitis showed perforation of the appendix, and yet suppurative peritonitis may occur without perforation. Local gangrene is caused by stoppage, infection of the walls, or torsion. A perforation is usually followed by local adhesions, that are afterward broken by accumulations of pus. An extraperitoneal abscess is not formed, as formerly supposed, but has for its outer wall the parietal peritoneum, and for its inner the adhesions that separate it from the general peritoneal cavity. Sudden collapse may occur immediately after the bursting of an abscess into the general peritoneal cavity; it is then from rapid absorption by the broad surface of peritoneum of ptomaines. Usually collapse happens only several days after the rupture occurred, the rupture at the time giving no signs. For it is impossible to regard the amount of pus we sometimes find in the abdomen, in an operation following collapse, as the accumulation of less than several days.

There may be a general septic peritonitis, with a pulse of 90 and temperature of 99° F. (1) Sudden attack of pain; (2) nausea or vomiting; (3) localized tenderness over appendix; (4) elevation of temperature. All four of these signs are needed to diagnose an appendicitis, and with them the diagnosis has never proved false.

The estimated mortality of all cases of appendicitis is twenty-seven to thirty per cent. The mortality in his series of one hundred and seventeen cases that were operated upon was between nine and ten per cent. The intrinsic peril of operation is practically *nil*.

Incision is to be made over the McBurney, or Kraft, point. The sides of the cavity are to be packed with gauze, that remains five to fifteen days. Never irrigate, but use dry sponging. Manipulation of peritoneum, roughening its endothelium, increases its liability to suppuration, and besides the fluid is likely to carry pus into healthy recesses as well as out of the wound.

When removal of the appendix necessitates breaking the wall of adhesions, it is not undertaken, but the patient is instructed

to summon the surgeon at the first symptom of the return that is almost inevitable. At that time the appendix is removed before pus has had time to form. Thus, of eight cases in which he could not remove the appendix at the first operation, in six he had secured it at a second.

Dr. Robert T. Morris, of New York, read a paper on

INFECTIOUS APPENDICITIS.

Within the outer serous envelope that formed an indistensible tube was an inner tube made up of mucosa, adenoid and muscular tissue. Thus the structure is precisely the same as of intestine, but the calibre is very small. Appendicitis is an infectious, exudative inflammation from displacement of the guarding epithelium, that gives a mixed bacterial infection of the adenoid. But when the inner distensible tube becomes swollen from infiltration within the outer indistensible tube, it must become choked and gangrene ensues. In mild cases exudation takes place slowly, and slow necrosis ensues. Spasm of the muscular wall produces quick necrosis.

The appendix is supplied by a single artery. An endarteritis once begun must end at length in obliteration, and in the death of the appendix from failure of blood supply. In the milder cases the incision should be in the trend of the external oblique, and but one inch and a half in length. The intestines may be rolled along over the finger tip until the appendix slips out. The base is turned in and the peritoneum brought together over it with catgut sutures. The after-disturbance is very slight, and it is difficult to keep patients in bed. In case of exudation the incision should be twice, in abscess three times, this length. A fifteen-volume solution of peroxide of hydrogen is used to irrigate the abscess cavity, and the drainage wick inserted.

Catarrhal appendicitis is a misnomer, as in all cases careful microscopic examination was made and the inflammation shown to be infectious exudative from the start. The prompt and invariable operative procedure urged is termed by some a fad, as was the removal of the appendages in the incipiency of that operation. Between the two procedures we must remember that in the one we have a useful organ, the removal of which was attended with danger to the subject's life, and resulted in certain undesirable after-effects, such as the termination of child-bearing; while in the appendix we have an entirely useless organ that may be removed without danger to life, and with positively no undesirable after-effects.

Dr. A. C. Bernays, of St. Louis, Mo., being asked by the Chairman to open the discussion, stated that it was difficult to discuss the papers, for the reason that both were so exceptionally complete and exhaustive that little was left to be said, and both treated the subject from the only scientific standpoint, viz., its

pathology. He had never seen a classification comparing with Dr. Murphy's; but Dr. Morris had gone further, insomuch as he dwelt on the bacterial origin of the disease. Dr. Morris had accounted for the frequent gangrene of the appendix by attributing it to strangulation of the inner coat by the harder serous covering, and Dr. Bernays was glad that he had been present to learn that point. The mortality of Dr. Murphy's operations, seven deaths out of one hundred and eleven operations, and of Dr. Morris', forty-eight cases with four deaths, was extremely creditable.

Dr. Bernays always makes a point of asking the attending physician a few questions before undertaking an operation for appendicitis—viz., how long the patient has had appendicitis, and whether any opium or morphine has been given. If the patient has been sick a week and an opiate has been given he refuses to operate, for, he said, "I do not like to perform ante-mortem post-mortems." He thought the danger of giving opium to a patient with appendicitis or obstruction of the bowels should be impressed upon the general practitioner. He knew that a great deal of the mortality in his practice was due to the use of this drug before the operation. When he has to operate upon a confirmed morphine user, he always sends the patient to a hospital some time beforehand and interdicts the drug in the interval. He considered the point about morphine very important.

Dr. J. Frank, of Chicago, Ill., said that, without going into the details of appendicitis, he would divide it into two classes, septic and aseptic. He had had four cases of the aseptic class, and every one of these had a fecal calculus. The operations had not been performed in the usual manner, but by laparatomy. One of his patients had been operated upon three times: first for cystic ovaries, second for appendicitis, and third for pain over the gall bladder supposed to be due to gall stones. His plan of operation differs materially from that of other operators, as he incises the peritoneum some distance from the appendix, pulls down the peritoneum as far as may be necessary, and then amputates the appendix.

Of septic cases he had from ten to fourteen. He agreed with Dr. Murphy as to the rarity of foreign substances in the appendix, as he had never found any foreign body. In one case he had introduced his finger and thought he had cleaned out everything, when he found a little opening from which another gush of pus came. He then provided for drainage by making a counter-opening in the lumbar region and inserting a drainage tube all the way through, and the patient made a rapid recovery.

He suggested that in his future operations Dr. Murphy should examine the appendix carefully for minute perforations. It might have been possible in some of his cases that a microscopic perforation existed through which the bacteria spoken of

by Dr. Morris had found an exit. No satisfactory explanation had ever before been offered for this general pus in the cavity. He agreed in the main with Dr. Bernays as to the impropriety of administering opium or morphine *before* a laparatomy, but asserted that it was of occasional advantage *after* an operation.

Dr. A. Lapthorn Smith, of Montreal, Canada, said he had never heard any papers which had given him such a clear idea of inflammation of the appendix as those of Dr. Murphy and Dr. Morris. Many things previously obscure had been made clear. He desired to know whether either of the authors could suggest any way of preventing the disease, aside from the correction of constipation.

Dr. Ernest W. Cushing, of Boston, Mass., said he had had an attack of appendicitis nineteen years ago, and he should never forget it. The main point is the question of early operation in nearly all cases, or delay until the disease has declared itself and perhaps gone too far. Boston surgeons wait until they are sure the disease is going to be severe, hence their large mortality. He did not believe that medicine had any effect whatever on the disease. The cases where medicine works well are those where either there is no appendicitis, or the case is a mild one, without gangrene, without suppuration, so that the patient would get well in any case. No medicine would cure bad cases; they would surely die unless relieved by an *early* operation; after general peritonitis had been set up it would be of little or no use. Late operations might save a certain number of cases in which the disease was fenced off by adhesions. He emphasized the fact that without operation there is a frightful mortality; instead of saying that the disease is not so bad after all, for two-thirds of the cases get well without an operation, we should say that the disease is a horrible one, for one-third of the cases die in spite of treatment. It is trifling with human life, he said, to dare to wait inactive to see in which category any given case belongs. On the other hand, what are the dangers of an early operation in competent hands? They are practically nothing. "If it were possible for any three of us," he said, "to receive a sure message from the future that the lot must fall on one of us to die within a week unless we all had our appendices removed at once, would any of us hesitate? No; we would rather say: 'Come, Murphy, come enter our abdomens, take our appendices, we are glad to be rid of them.'"

Dr. Eliza M. Mosher, of Brooklyn, N. Y., said the question of the causation of appendicitis was a most important one. She related the case of a patient in whom a sharp attack of appendicitis followed a large enema of warm water with the body reversed. The attack, however, subsided after reaching the point where an operation seemed inevitable. The patient gave a history of two previous attacks of inflammation in the same region. Dr. Mosher thought there was some connection between

the flushing of the bowel, the manual pressure, and this attack of appendicitis.

DR. MURPHY, in closing the debate on his paper, said that the fact that there were a number of cases which get well without an operation was no argument against operating in the majority of cases. He had operated on a man who had been in the hands of twenty-one doctors, and every one (they alleged) had cured him—they had twenty-one cures to his one. He said that the cecum might sometimes be found far out of place. Dulness on percussion was not to be relied on. Pus or gangrene had been the cause of about ninety-nine per cent of his cases.

DR. MORRIS, in closing the discussion, said, in reference to Dr. Bernays' question as to whether there was not sometimes endarteritis with appendicitis, that the patient mentioned by him, and referred to by Dr. Bernays, had no other disease, but had had a mild attack of appendicitis a long time. He had never found a case of catarrhal appendicitis, although he had had several assistants looking for it for some time. He regarded opium as a dangerous drug, but said a very little might be allowed the first night if the bowels could be opened the next morning. In reply to Dr. Lapthorn Smith's question, he stated that the removal of constipation was the removal of one of the dangers of appendicitis, and that if the cecum were loaded with fecal matter it would crush the mucosa.

HABITS OF POSTURE A CAUSE OF DEFORMITY AND DISPLACEMENT OF THE UTERUS

was the title of a paper read by DR. ELIZA M. MOSHER, of Brooklyn, N. Y., in which she described an instrument she had devised for measuring and recording the obliquity of the pelvis. She held, and cited many cases in proof, that any habitual faulty position in sitting or standing which lessened the normal pelvic obliquity would cause or strongly predispose to many forms of uterine deformity.

DR. A. LAPTHORN SMITH, of Montreal, Canada, thought the paper of Dr. Mosher a very valuable one. The profession was devoting too much attention to the treatment of diseases and not enough to their prevention, but the old axiom was still as true as ever that "an ounce of prevention is worth a pound a cure." Dr. Mosher had treated the subject of retroversion in the single woman, while he treated the condition in married women. He said the condition was a source of much discomfort, and he believed it to be a frequent cause of fibroids. He did not believe there was any such thing as a pathological anteversion. The Almighty intended that every time a woman lifted a weight the round ligaments should contract and the uterus fall forward.

DR. MOSHER said, in closing the debate, that she thought the profession overestimated the value of the round ligaments.

They were only calculated to act as "stay lines" *to be used in emergencies*. Their work should be minimized and supplemented by the force of gravitation, which was to be obtained by placing the pelvis at its normal angle of anterior obliquity.

ABSTRACTS.

1. MONOD, E.: PSEUDO-MEMBRANOUS ENTERITIS AND ITS RÔLE IN GYNECOLOGY (*Nouv. Arch. d'Obst. et de Gyn.*, September, 1893).—The relative frequency with which intestinal colic accompanied by a discharge of membranous débris is met with in patients suffering from uterine disorders, leads Monod to believe that there is a more intimate relation between the two conditions than is usually supposed. He quotes at length six cases occurring in his practice.

The pain complained of was usually situated in the region of the transverse colon and was intermittent and paroxysmal in its nature. In three of the cases in which dysmenorrhea and membranous enteritis coexisted, the intestinal crises either appeared or were intensified at the menstrual periods. Constipation was marked. Nervous symptoms were manifested in varying degrees. The discharges contained thick mucus adhering to the feces, or veritable tough membranes in ribbon-like form, plaques, or fibrinous shreds.

The treatment of greatest benefit in these cases was found to be a milk diet, alkaline waters, and such intestinal antiseptics as naphthol and salol. The essential point being to overcome the constipated habit, oily purgatives are administered, and daily injections, simple or borated. During the crises of pain tincture of iodine or vesicatories applied to the abdomen may give relief.

Is it possible to prove a direct relationship between the colitis and the genital affection?

Pseudo-membranous enteritis is of more frequent occurrence in the female than in the male. A greater predisposition to neuropathic disorders, and consequently to constipation, will in part account for this condition, but other causes seem to Monod to play an important part. In the six cases which he describes the very marked intestinal symptoms coexisted with no less marked uterine or peri-uterine affection. In three patients there was pseudo-membranous dysmenorrhea, in one endometritis with chronic cervical metritis. The fifth case had, in addition to metritis, prolapsus in the first degree and retroflexion. In the sixth case there was inflammation of the adnexa. In each case the uterine symptoms preceded the intestinal. It can readily be seen that retroflexion and retroversion, by pressure upon the intestines, might cause constipation, itself an active

propagation of the inflammation to the neighboring portions of intestine seems rational enough. Inflammatory exudations also might play a part by mechanical compressure.

When a patient suffering from metritis, perimetritis, or uterine displacement complains of persistent abdominal pain, a minute analysis of the symptoms will often convince the practitioner that the origin of the pain is not, as he would naturally suppose, the genital, but the intestinal tract. A. R. S.

2. Bouchacourt, A.: An Hippocratic Contribution to the Study of Nervous or Imaginary Pregnancy (*Nouv. Arch. d'Obst. et de Gyn.*, September, 1893).—The author submits a number of quotations from the works of Hippocrates, from which he draws the following conclusions:

1. Many of the observations of the Father of Medicine may be classified under the head of false pregnancies, designated by Girard, Baudelocque, Gardier, Schmitt, and other more modern obstetricians as nervous or imaginary pregnancies.

2. In spite of the imperfection of the methods of investigation at Hippocrates' disposal, he was often able to make a clear diagnosis and to point out the pathological causation, not with sufficient precision, however, to meet the therapeutic indications. He proved that these false pregnancies, so far from preventing real pregnancies, may anticipate and even favor their development.

3. He showed the relations which may exist between sterility and various local or general morbid conditions.

4. Finally, it may be affirmed that Hippocrates endeavored to study the clinical phenomena of normal pregnancy at a time when physicians intervened but rarely in this class of cases, which were under the jurisdiction of the *naturalists*, represented by Aristotle and his commentators. Even at the present day many of his observations upon this subject might serve as models for study and clinical analysis. A. R. S.

ITEM.

At the annual meeting of the New York Obstetrical Society, held Tuesday evening, October 17th, 1893, the following were elected officers for 1893–94: Charles Jewett, *Pres.;* Egbert H. Grandin, *1st Vice-Pres.;* George M. Edebohls, *2d Vice-Pres.;* Arthur M. Jacobus,* *Rec. Sec.;* J. Riddle Goffe,* *Ass't Rec. Sec.;* Augustus J. Buckmaster, *Cor. Sec.;* J. Lee Morrill,* *Treas.;* George C. Freeborn,* *Pathologist.*

* Re-elected.

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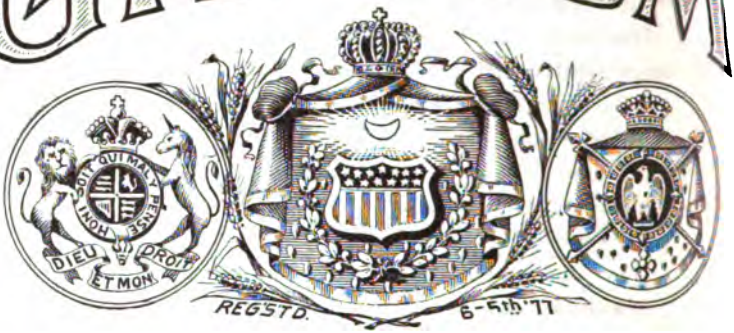
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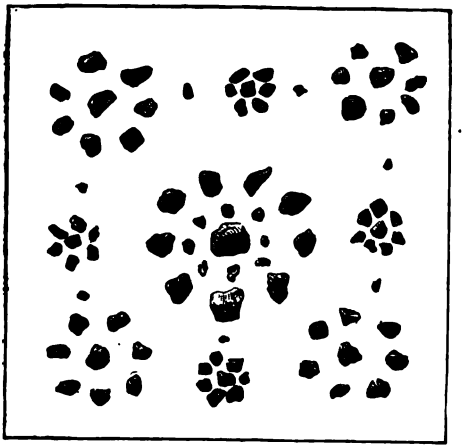


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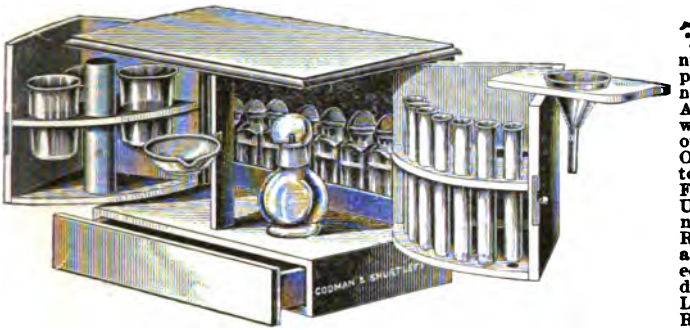
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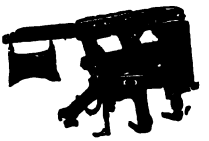



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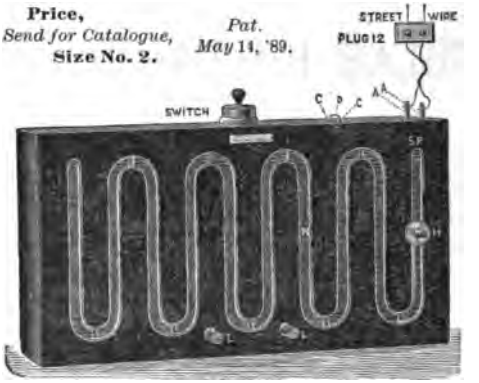
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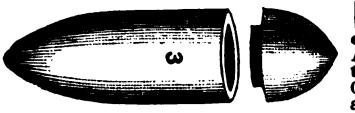
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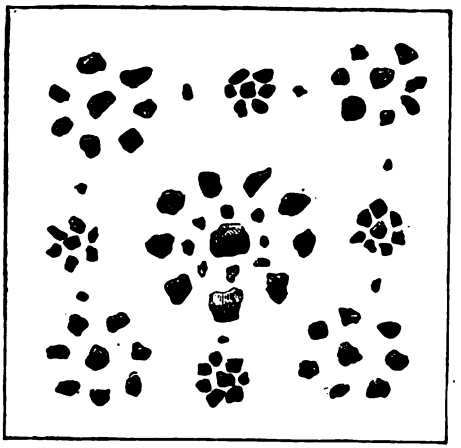


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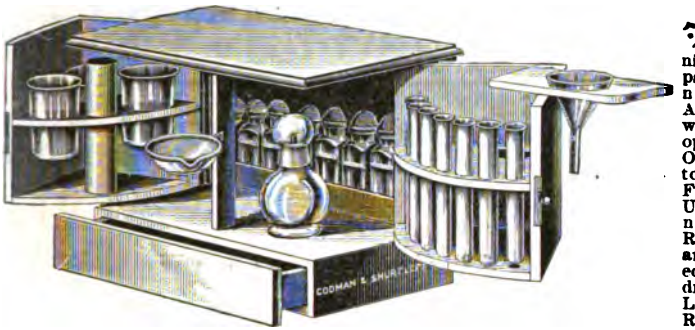
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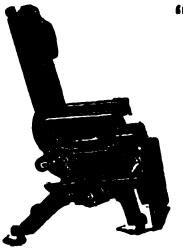
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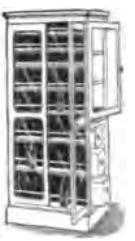
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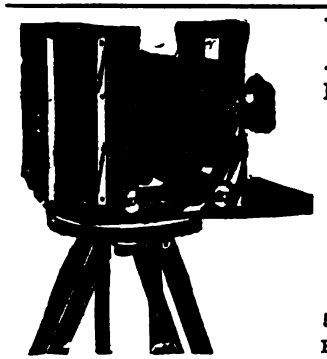
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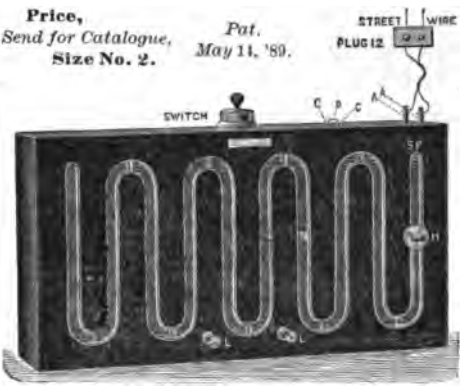
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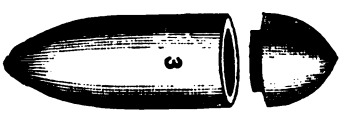
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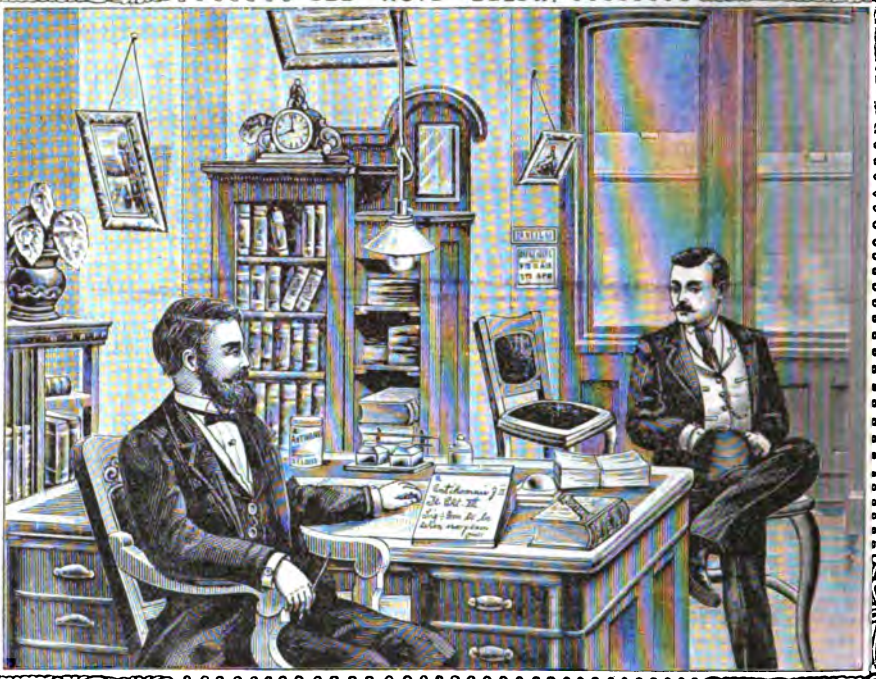
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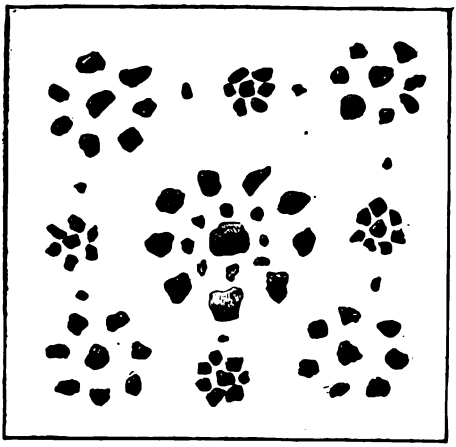


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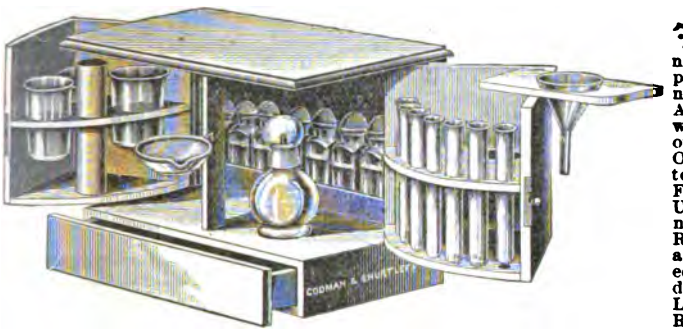
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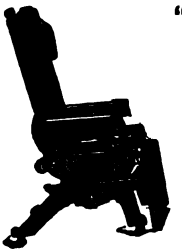
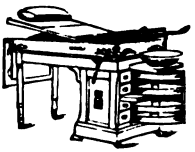
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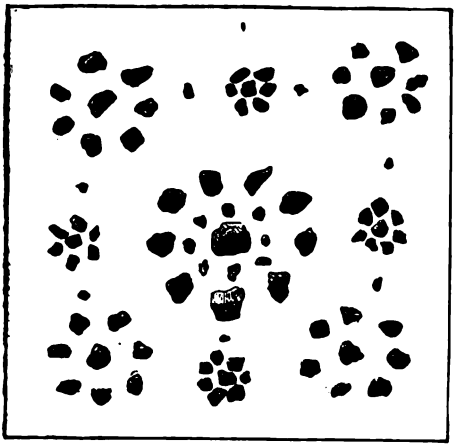


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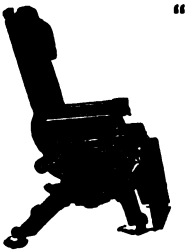
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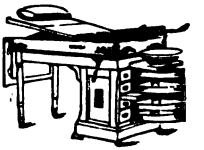
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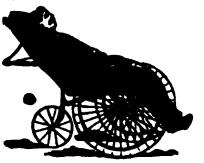


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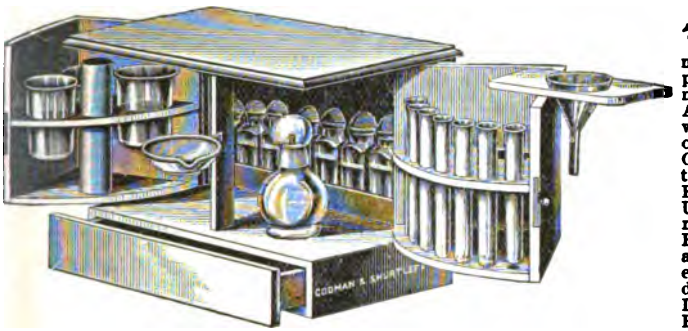
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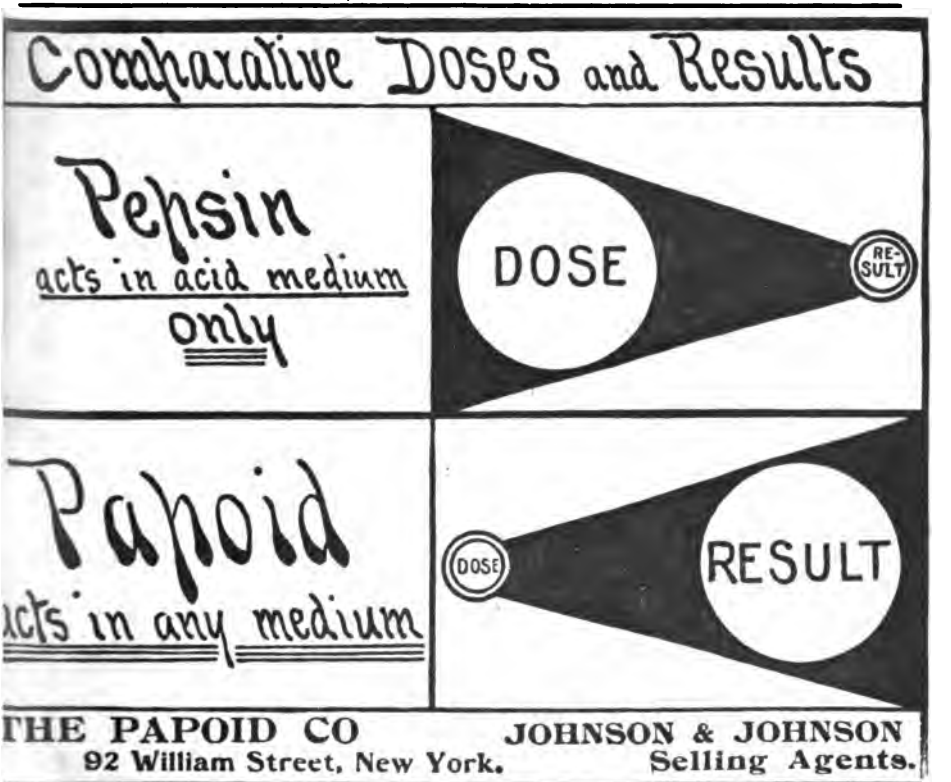
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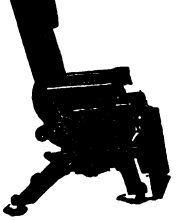
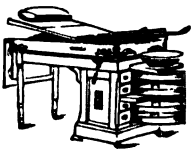
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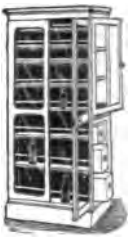
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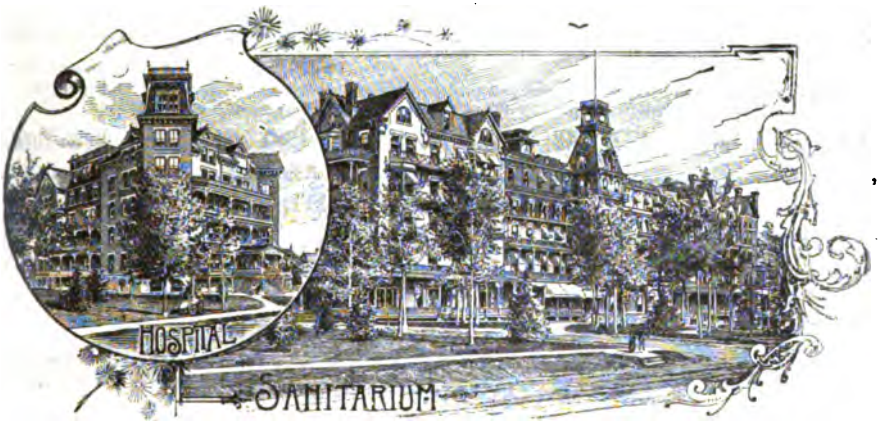
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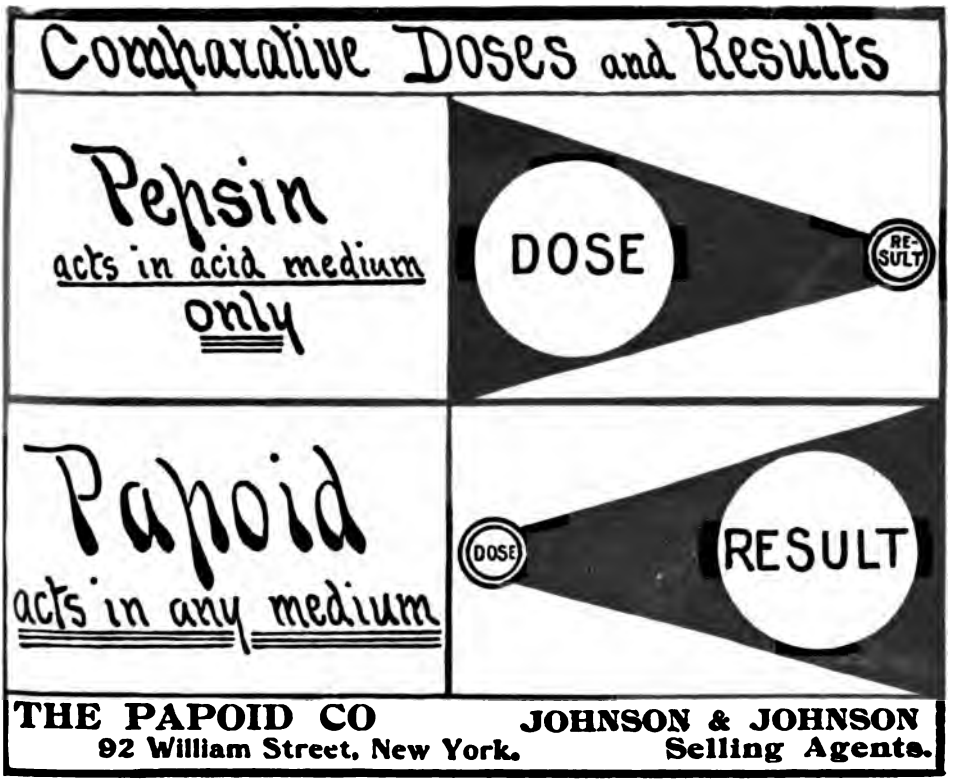
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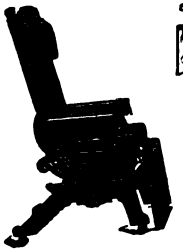
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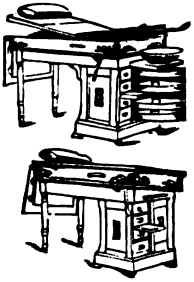
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